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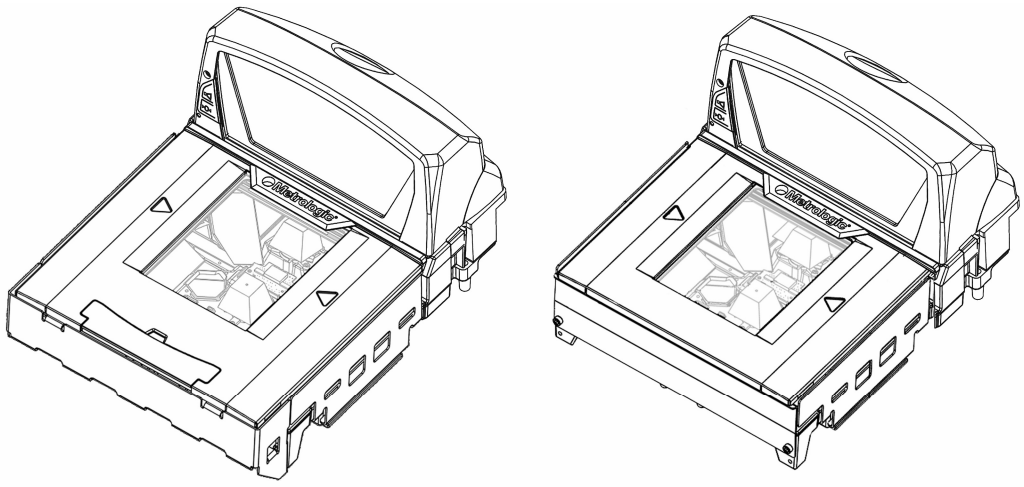
METROLOGIC INSTRUMENTS, INC.

MS2421 / MS2422
Bar Code Scanner
Installation and User's Guide



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INTRODUCTION

MANUAL SCOPE

This guide provides information on the installation, setup and operation of the MS2421 and the MS2422 *scanner only models*. If the MS2421 scanner has been integrated with a scale, please refer to the ***Scale Addendum*** for detailed instructions on the appropriate cable connections, communication specifications and calibration procedures required by the scale manufacturer and local Weights and Measures Authorities.

This manual is also available for download in Adobe® Acrobat® file format at www.metrologic.com/corporate/guides.htm.

PRODUCT OVERVIEW

Metrologic's MS2421 and MS2422 scanner models are designed to meet the demanding needs of high volume supermarket and point-of-sale applications. With advanced features like 5-sided, 360° scanning, 5400 scans per second, a complex scan zone and advanced decoding software, this high performance series of in-counter scanner/scale ready products guarantees fast customer checkouts with minimal operator fatigue and stress. The MS2421 and MS2422 scanners are equipped with a multitude of standard features including:

- Stratos***SCAN***™ – 5-sided, 360° scanning that minimizes product orientation
- Stratos***SPHERE***™ – Decoding software that reads poor quality and damaged bar codes
- Stratos***SYNC***™ – Horizontal and vertical scanning zones operate independently from one another
- RSS-14 Decoding – Decodes RSS-14, RSS Limited and RSS expanded emerging symbologies
- Flash ROM – Upgrade latest software enhancements on site
- Powered Aux Port – Connect hand-held scanner for large or bulky items
- Scale Ready Model – The MS2421 model is designed for custom scale integration
- Loud Speaker – 3 volume/7 tone settings can be heard in all environments
- Easy Configuration – Windows® based utility or simple bar code setup
- Fully Automatic – "No touch" infrared wake up from power save modes
- EAS Deactivation – Electronic Article Surveillance (EAS) included
- Field Replaceable Vertical Window – Quickly remove vertical window for cleaning or replacement
- Stratos***SCOPE***™ – Visual diagnostic indicator for easy-to read feedback on scanner condition
- Stratos***SWAP***™ – Modular optics engine technology – small, pre-aligned, field replaceable modules
- Stratos***SCHOOL***™ – Operator training software

BASE KIT COMPONENTS

BASE KIT COMPONENTS			
Part #	**Description**		
MS242*x*-105N*z*	Bar Code Scanner		
	x	1	Scanner Only, Scale Ready – Compact
		2	Scanner Only – Sub-Compact
	z	D	Diamonex Horizontal Window
		S	Sapphire Horizontal Window
00-02407	MetroSelect® Configuration Guide		
00-02034	MS2*xxx* Stratos Series Configuration Addendum		
00-05311	MS2421 / MS2422 Bar Code Scanner Installation and User's Guide		

Guides also available for download at www.metrologic.com.

Other items may be ordered for the specific protocol being used. To order additional items, contact the dealer, distributor or call Metrologic's Customer Service Department at 1-800-ID-METRO or 1-800-436-3876.

OPTIONAL ACCESSORIES

OPTIONAL ACCESSORIES	
Part #	**Description**
57-57210*x*-N-3	RS232 Interface Cable, Straight, 3.7 m (12') Cord with Short Strain Relief
57-57212*x*-N-3	IBM 46xx Port 9 Cable, Straight 3.7 m (12') Cord
57-57201*x*-N-3	USB Full Speed Communication Cable, Straight 4.0 m (13') Cord, Type A (Non-Locking) Connector
57-57227*x*-N-3	USB Full Speed Communication Cable, Straight 4.0 m (13') Cord, Locking 12V Plus-Power™ Type A
57-57008*x*-N-3	Aux Program Cable, Straight 2.3 m (7.5') Cord with Short Strain Relief
57-57099*x*-3	LSO RS232 PowerLink AUX Cable with built in power jack, Straight, 2.1 m (7') cord
52-52511*x*	24" EAS cable

OPTIONAL ACCESSORIES

OPTIONAL ACCESSORIES	
Part #	**Description**
AC to DC Power Transformer - Regulated Output: +5.2V @ 2.5A +12V @ 0.8A	
46-00226	120V United States and Canada
46-00227	220V – 240V Continental European
46-00228	220V – 240V United Kingdom
46-00229	220V – 240V China
46-00230	220V – 240V Australia

REPLACEMENT PARTS

REPLACEMENT PARTS	
Part #	**Description**
⚠ Caution	Window types (Diamonex and Sapphire) are <u>not</u> interchangeable due to laser safety and/or scanner performance differences. To change window type, the scanner must be returned to the manufacturer for reconfiguration.
46-00233	Diamonex Platter – Compact
46-00296	Diamonex Platter – Compact with Platter Lift Handle
46-00234	Diamonex Platter – Sub-Compact Size
46-00235	Sapphire Platter – Compact
46-00297	Sapphire Platter – Compact with Platter Lift Handle
46-00236	Sapphire Platter – Sub-Compact Size

Other items may be ordered for the specific protocol being used. To order additional items, contact the dealer, distributor or call Metrologic's Customer Service Department at 1-800-ID-METRO or 1-800-436-3876.

GENERAL PRECAUTIONS

The following are some general precautions to remember when handling the MS2421/MS2422 scanner.

DO NOT TURN the unit upside down with the platter in place.

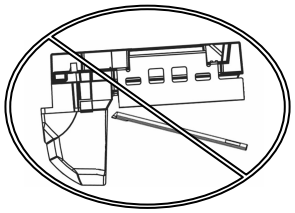


Figure 1

DO NOT PRESS on the window in the platter or the vertical window frame.

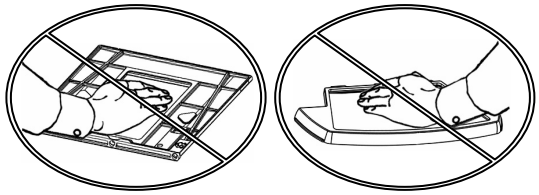


Figure 2

PLATTER REMOVAL

No hardware or tools are required to remove the platter (see Figure 3). Refer to the Maintenance section of this manual for additional information on platter replacement.

⚠ *See caution statement on page 3.*

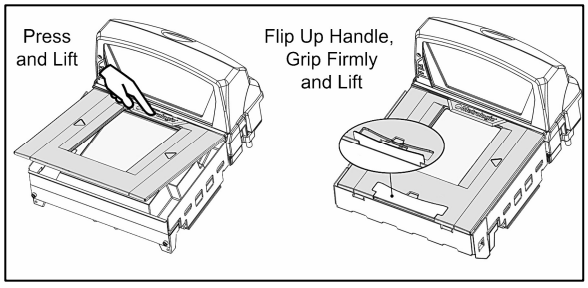


Figure 3

FINGER RECESSES

There are two finger recess areas provided to assist when lifting the MS2421/MS2422 scanner. **REST** both thumbs against the vertical window frame for added stability when lifting the unit by the finger recesses.

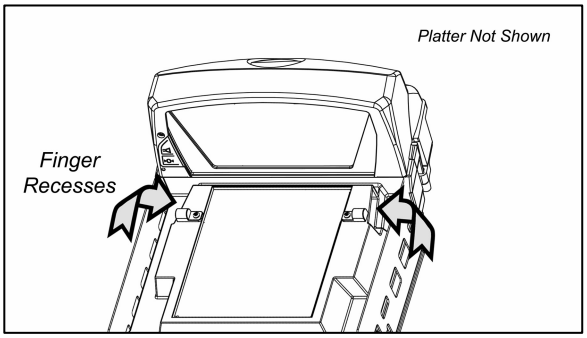


Figure 4

MS2421 / MS2422 SCANNER DESIGN SPECIFICATIONS

	Design Specifications		
Operational			
Light Source:	VLD 650 nm		
Peak Laser Power:	<1.5 mW		
Horizontal Depth of Field:	0 mm - 152 mm (0”- 6”) for 0.33 mm (13 mil) Bar Code		
Vertical Depth of Field:	0 mm - 216 mm (0”- 8.5”) for 0.33 mm (13 mil) Bar Code		
Scan Speed:	5400 Scan Lines per Second		
No. of Scan Lines:	54 (38 Horizontal / 16 Vertical)		
Motor Speed:	6000 / 6000 RPM (Horizontal / Vertical)		
Min Bar Width:	0.127 mm (5.0 mil)		
Scan Zone:	360°		
Decode Capability:	All Standard 1-D Bar Codes, RSS-14, RSS-Expanded, and RSS-14 Limited Bar Codes		
System Interfaces:	RS232, Aux RS232, IBM468x/469x, and USB		
Print Contrast:	35% Minimum Reflectance Difference		
No. Characters Read:	Up to 80 data characters. Maximum number will vary based on symbology and density.		
Beeper Operation:	7 Tones or No Beep; 3 Volume Settings		
Indicators (LED):	Blue	Laser ON, Ready to Scan	
	Blue flash	Good Read, Decoding	
Mechanical			
MS2421 L x W x H:	399 mm (15.7") Length	292 mm (11.5") Width	130 mm (5.12") Tower Height
MS2422 L x W x H:	353 mm (13.9") Length	292 mm (11.5") Width	130 mm (5.12") Tower Height
Depth (Below Counter):	100 mm (3.9"), All Models		
Weight (with Platter):	MS2422, 5.98 kg (13.20 lbs.)	MS2421, 9.28 kg (20.5 lbs.)	
Electrical			
Voltage Supply:	2.5A @ +5.2V / 0.8A @ +12V		
Power:	Operating, 11.9 Watts	Standby, 3.25 Watts	
Current:	Operating, 1.7A @ 5.2V / 0.2A @ 12V	Standby, .6A @ 5.2V / 0.07A @ 12V	
Current Limits on Integrated Scale and/or Scale Display:	Do not exceed maximum current of 12V @ 0.7A / 5V @ 0.2A		
DC Transformers:	Class I; 5.2VDC @ 2.5A; 12VDC @ 0.8A		
For Regulatory Compliance Information refer to pages 53 - 55.			
Environmental			
Operating Temperature:	0°C to 40°C (32°F to 104°F)		
IP Rating:	IP 55		
Light Levels:	4842 Lux (450 footcandles)		
Storage Temperature:	-40°C to 60°C (-40°F to 140°F)		
Humidity:	5% to 95% Relative Humidity, Non-Condensing		
Contaminants:	Sealed to resist airborne particulate contaminants.		
Ventilation:	None Required		

Specifications are subject to change without notice.

MS2421 Scanner

Components

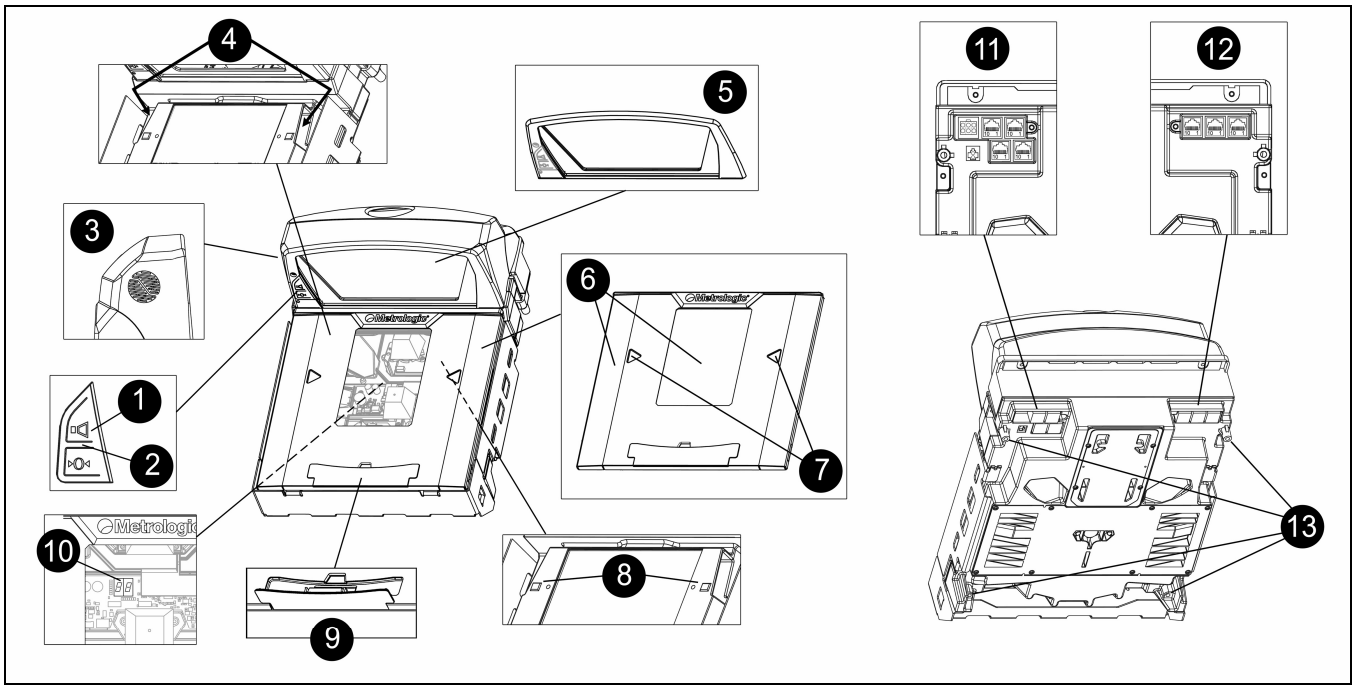


Figure 5. MS2421 Components

Components

ITEM NO.	DESCRIPTION OF ITEM
1	Volume/Tone Multi-Function Button *(see page 35)*
2	Blue LED Indicators *(see page 29)*
3	Speaker
4	Finger Recesses for Lifting
5	High Impact Window Frame / Vertical Window (Laser Aperture)
6	Replaceable Stainless Steel Platter with Diamonex or Sapphire Horizontal Window (Laser Aperture)
7	Flow Direction Indicators
8	Platter Support Bumpers *(see page 37)*
9	Optional Product Weight Roll Bar / Platter Lift Handle (Option provided with *scale ready* MS2421-105x models only.)
10	Diagnostic Indicator Display *(see page 31 for Error Codes)*
11	DC Power, Scale, and EAS Connectors *(see page 7)*
12	System Interface Connection Area *(see page 7)*
13	Optional Leveling Feet (Option provided with *scale ready* MS2421-105x models only.)
	Scanner label information can be found on page 8.

MS2421 Scanner

Dimensions

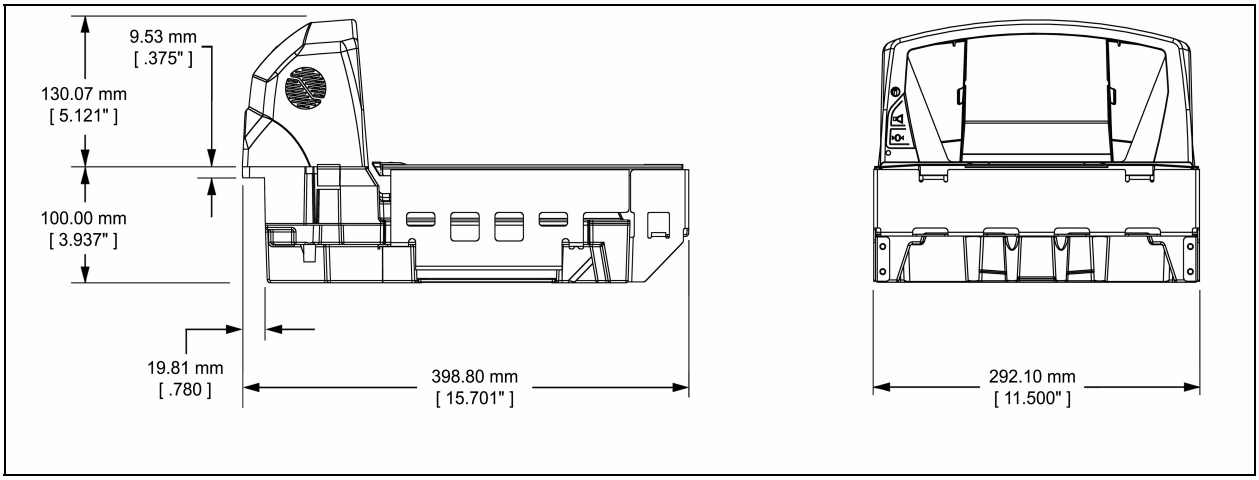


Figure 6. MS2421 Dimensions

Connector Panel

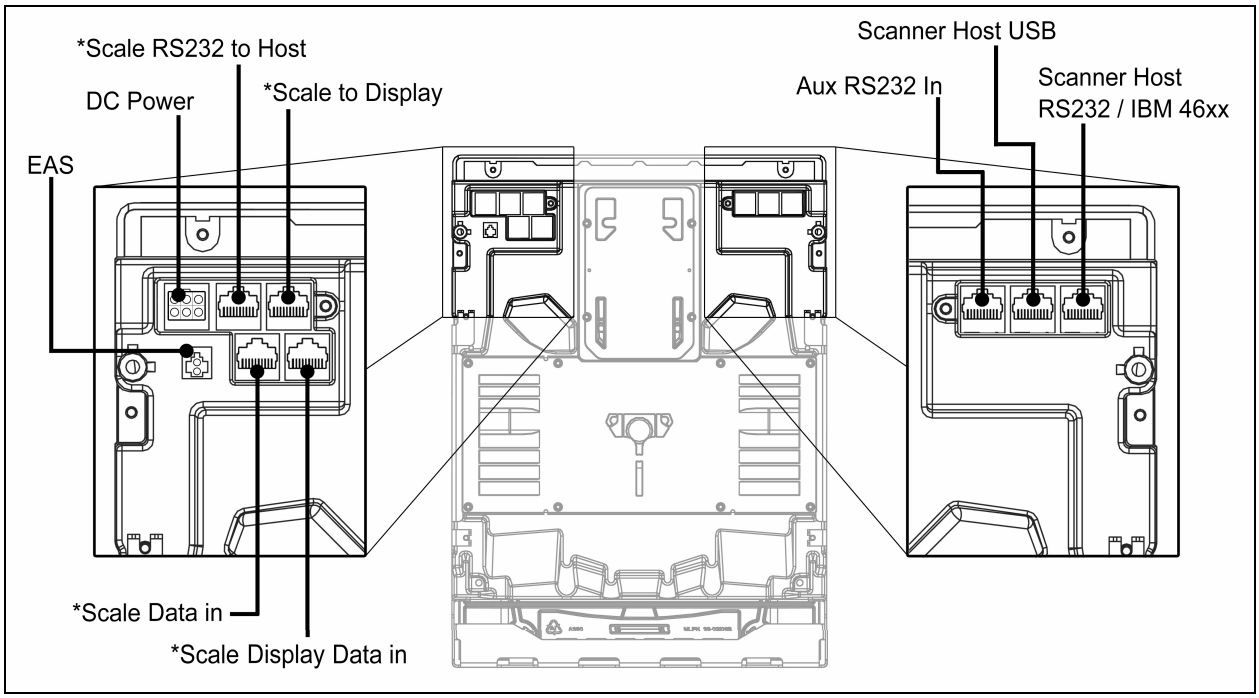


Figure 7. MS2421 Connector Panel

***** Scale ready MS2421 models supply additional connectors for scale and display communication cabling. The use of these connections is dependent on the specific manufacturer of the scale being integrated. Please refer to the custom ***Scale Installation Guide*** for detailed instructions on the appropriate cable hookups and calibration procedures for local Weights and Measures authorities.

Specifications are subject to change without notice.

MS2421 Scanner

Caution and Serial Number Labels

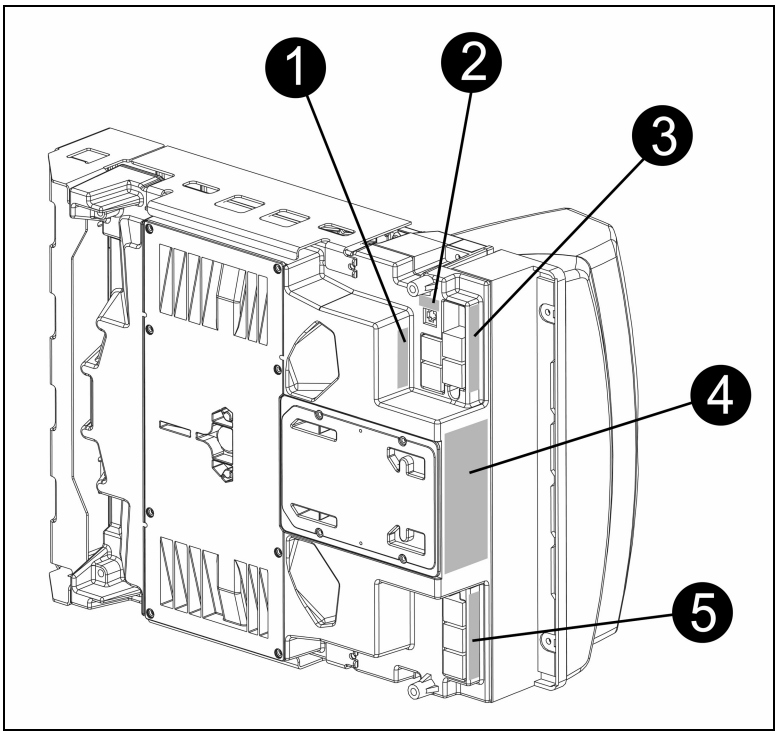
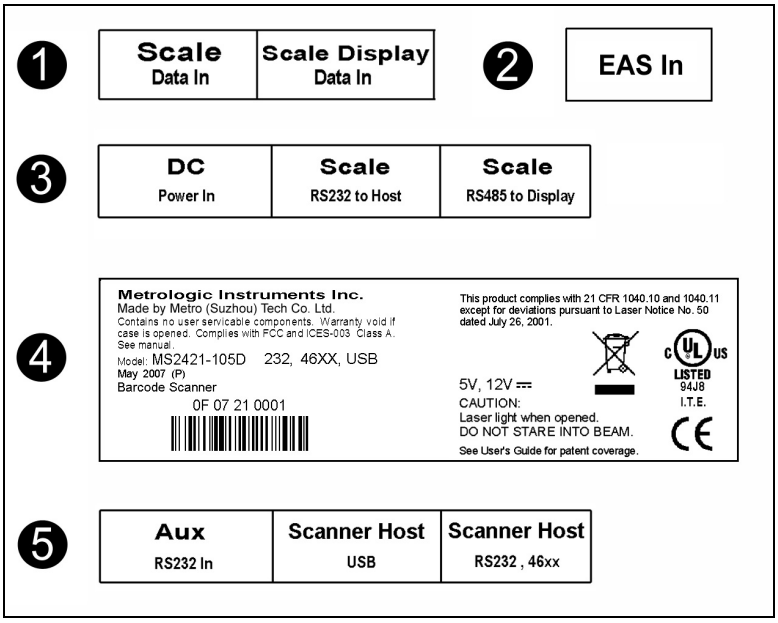


Figure 8. MS2421 Label Locations (Top) and Examples (Bottom)



Caution: To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950-1.

To maintain compliance with standard CSA C22.2 No. 60950-1/UL 60950-1 and norm EN/IEC 60950-1, the power source should meet applicable performance requirements for a limited power source.

MS2422 Scanner

Components

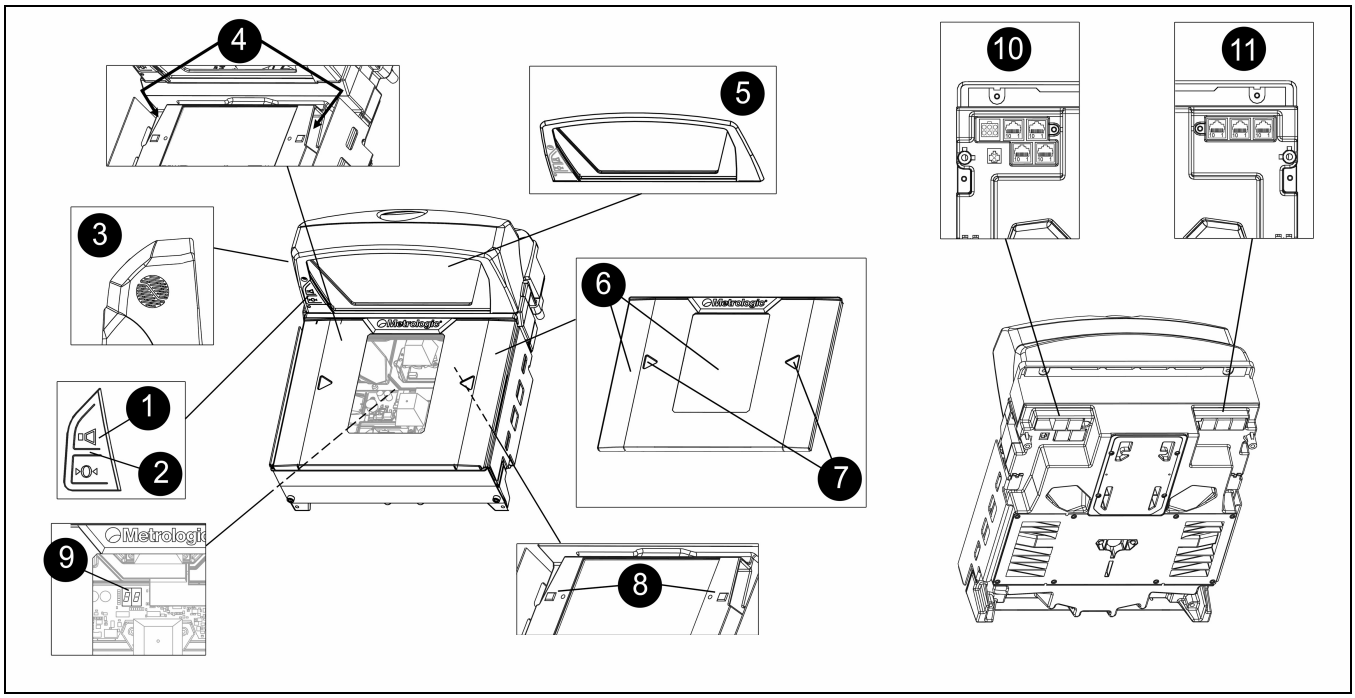


Figure 9. MS2422 Components

Components

ITEM NO.	DESCRIPTION OF ITEM IN FIGURE 15
1	Volume/Tone Multi-Function Button *(see page 35)*
2	Blue LED Indicators *(see page 29)*
3	Speaker *(see page 29)*
4	Finger Recesses for Lifting (Located Under Platter)
5	High Impact Window Frame / Vertical Window (Laser Aperture)
6	Replaceable Stainless Steel Platter with Diamonex or Sapphire Horizontal Window (Laser Aperture)
7	Flow Direction Indicator
8	Platter Support Bumpers *(see page 37)*
9	Diagnostic Indicator Display *(see page 31)*
10	DC Power, Scale, and EAS Connectors *(see page 10)*
11	System Interface Connection Area *(see page 10)*
	Scanner label information can be found on page 11.

MS2422 Scanner

Dimensions

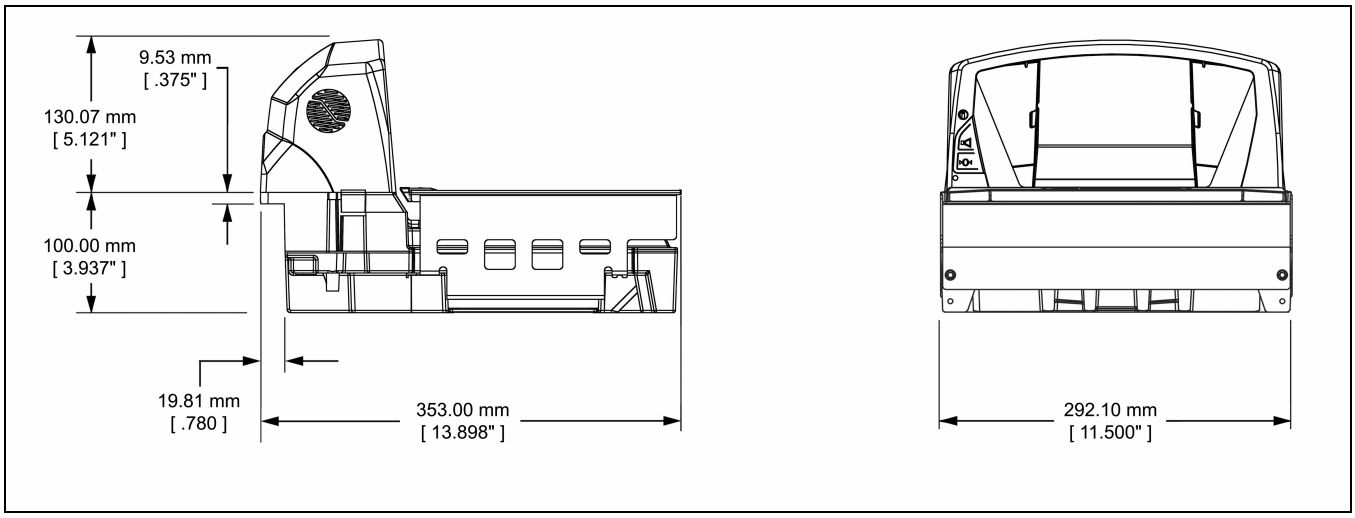


Figure 10. MS2422 Dimensions

Connector Panel

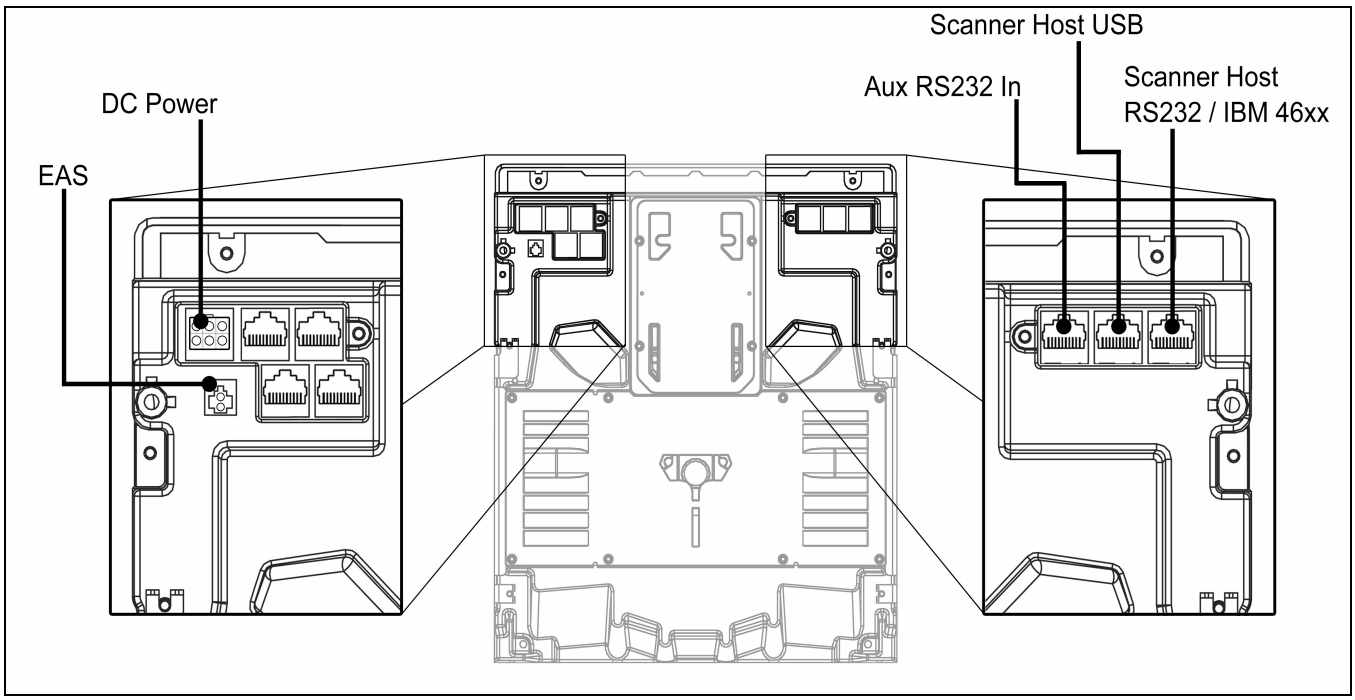


Figure 11. MS2422 Connectors

Specifications are subject to change without notice.

MS2422 Scanner

Caution and Serial Number Labels

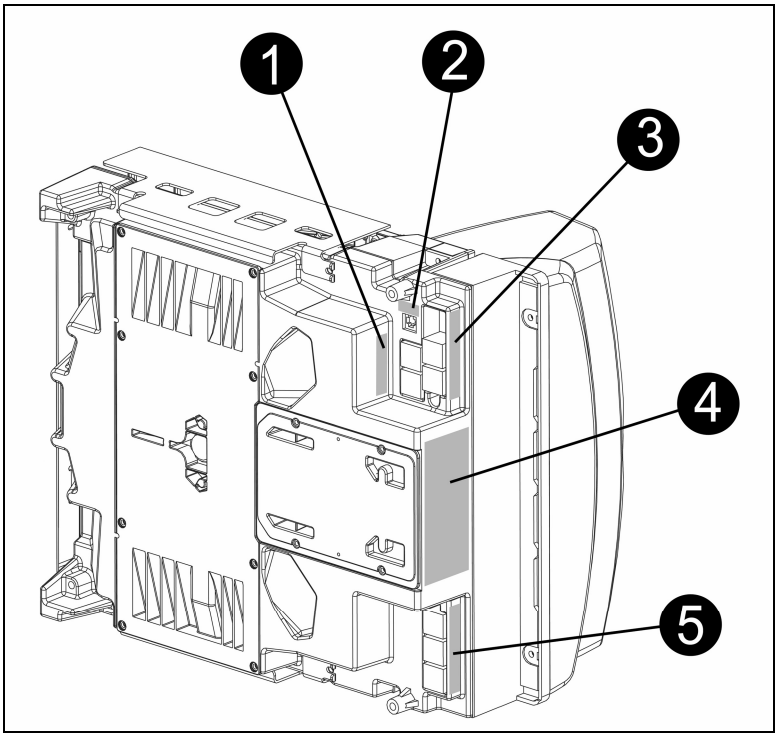
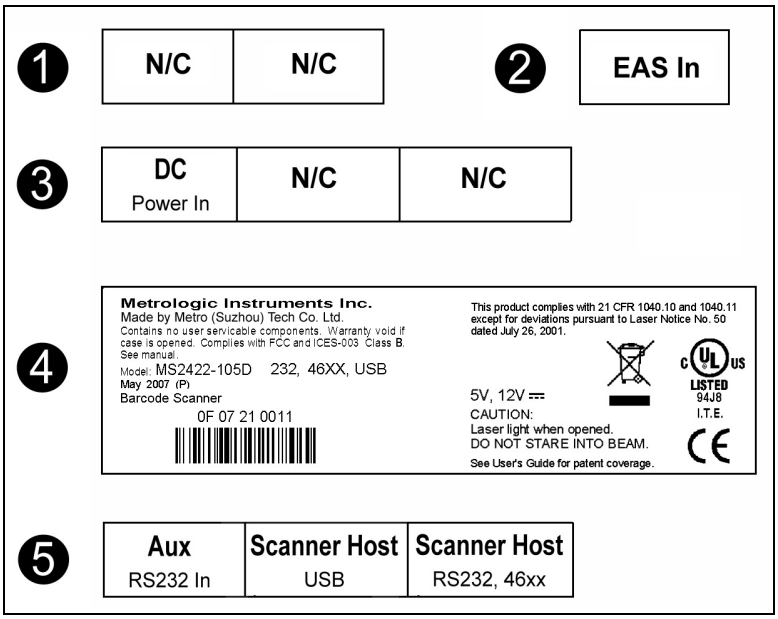


Figure 12. MS2422 Label Locations (Top) and Examples (Bottom)



Caution: To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950-1.

To maintain compliance with standard CSA C22.2 No. 60950-1/UL 60950-1 and norm EN/IEC 60950-1, the power source should meet applicable performance requirements for a limited power source.

QUICK INSTALLATION OUTLINE

The following is a quick preview of the steps required for 1st time installations. Each item is discussed in detail later in this section.

- Determine clearance, ventilation and service access requirements.
- Determine checkout counter layout taking into account package flow, cable routing and power requirements.
- Choose the mounting option which provides the best cable/power access and unit stability.
- Unpack the unit.
- Make the appropriate countertop cutouts and install all support brackets.
- Place the unit in the counter.
- Install the platter.
- Follow the steps under the correct interface to connect the cables and power supply.
- Configure the unit for the correct interface.

SITE REQUIREMENTS

Before installing your MS2421/MS2422 bar code scanner, please consider the following items.

Vertical Clearance

A minimum clearance height of 5.25" from the checkout counter surface is needed for the vertical 'hood' on all of the scanner models.

Ventilation and Spacing

The MS2421/MS242 models have a die-cast housing to dissipate heat allowing the unit to operate without a ventilation fan. Metrologic recommends that the temperature surrounding the unit does not exceed 40°C (104°F). There should be adequate convection and minimal heat producing equipment in close proximity of the unit. A cooling fan with a filter is recommended if there will be a conveyor motor or other heat producing equipment close to the unit that will create a high temperature environment.

Service Access

When routing and installing the cable(s) and power supply, make sure you leave access so that these components may be swapped easily without the need to remove the unit from the checkout counter.

When changing the Stratos*SWAP* optics engine modules, Metrologic recommends removing the unit completely from the checkout counter.

Power Installation

The Power Supply (AC/DC) should be connected to an AC Outlet that is free of electrical noise (clean). A qualified electrician can determine the amount of electrical noise on the AC line. See additional information on power installation and restrictions under the Installation: Interface section of this manual.

Metrologic recommends using a switched AC outlet. The switch should be located on the operator's side of the checkout counter in close proximity to the scanner to facilitate service of the unit.

Checkout Counter Layout Considerations

When placing a scanner in a checkout counter, the following factors should be considered.

- Items should flow at a distance to the operator that maximizes comfort. The operator should not need to stretch or strain to reach for and scan packages.

- The MS2421/MS2422 can scan a bar code on five sides of a package. The packages should flow into the scan area that provides the maximum reading performance. No lifting or orientation of the items is necessary. A properly placed item diverter can maximize the flow of packages.

- In what direction are the packages flowing? Most checkout counters are designed for left-handed takeaway. If the operator is facing the vertical window of the scanner, packages flow from the operator's right to left. The packages are in queue on the conveyor to the right and the bagging is to the left.

UNPACKING THE UNIT

1. Make sure the shipping box is top-side up before opening.

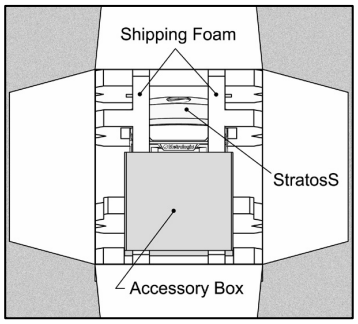


Figure 13

2. Remove the accessories box and check the box's content for the following items.
   - Product Manuals
   - Power Supply
   - Communication Cables

3. Lift the scanner out of the shipping box by gripping the **bottom** of the unit on both sides.

   Important! **Do not** lift the unit out of the box by gripping the sides of the platter.

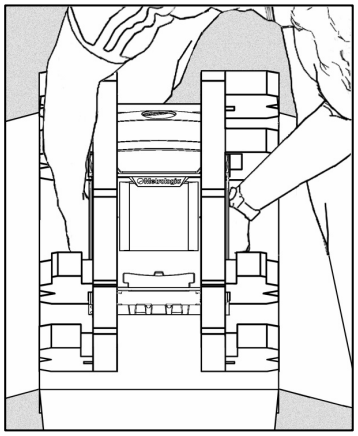


Figure 14

4. Carefully remove the shipping foam around the unit.

   Important! **Do not** turn the unit upside down or tilt the unit onto its side while removing the shipping foam. The platter is not attached to the unit and can fall off!

5. Lift the platter off the unit and store it in a safe location until the unit is installed in the checkout counter.

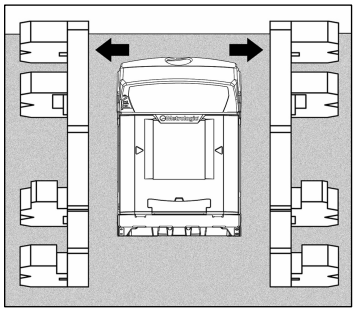


Figure 15

Once the unit has been properly installed in the checkout counter, remove all protective film covering the platter's horizontal window, the horizontal window under the platter on the unit base, and the vertical window. **The unit will not function properly if the protective films are not removed.**

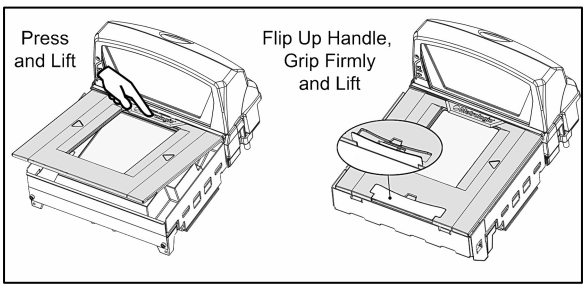


Figure 16

INSTALLING THE UNIT IN THE COUNTER

MS2421 Mounting Diagram

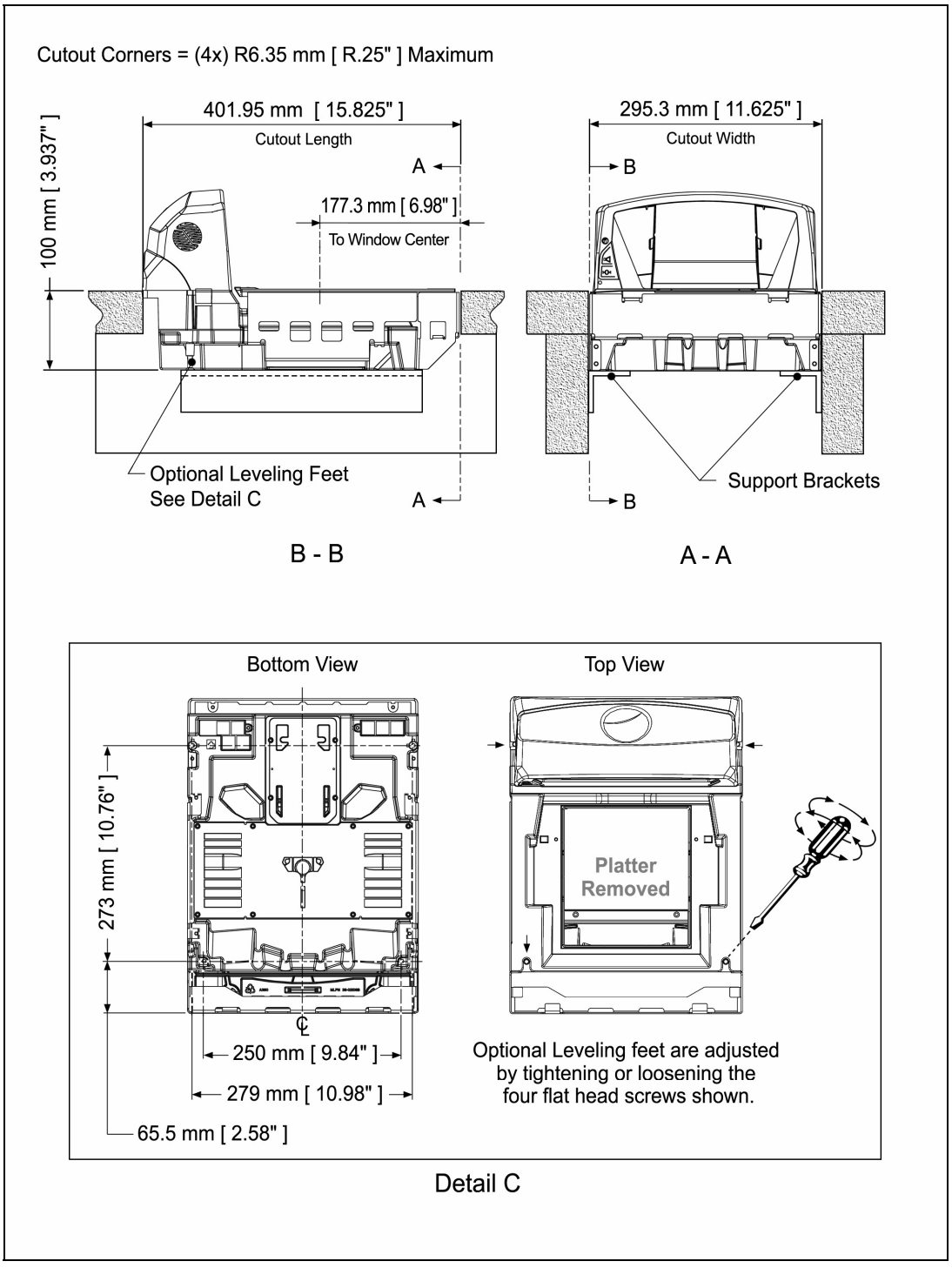


Figure 17. MS2421 Mounting Diagram

Specifications are subject to change without notice.

INSTALLING THE UNIT IN THE COUNTER

MS2422 Mounting Diagram

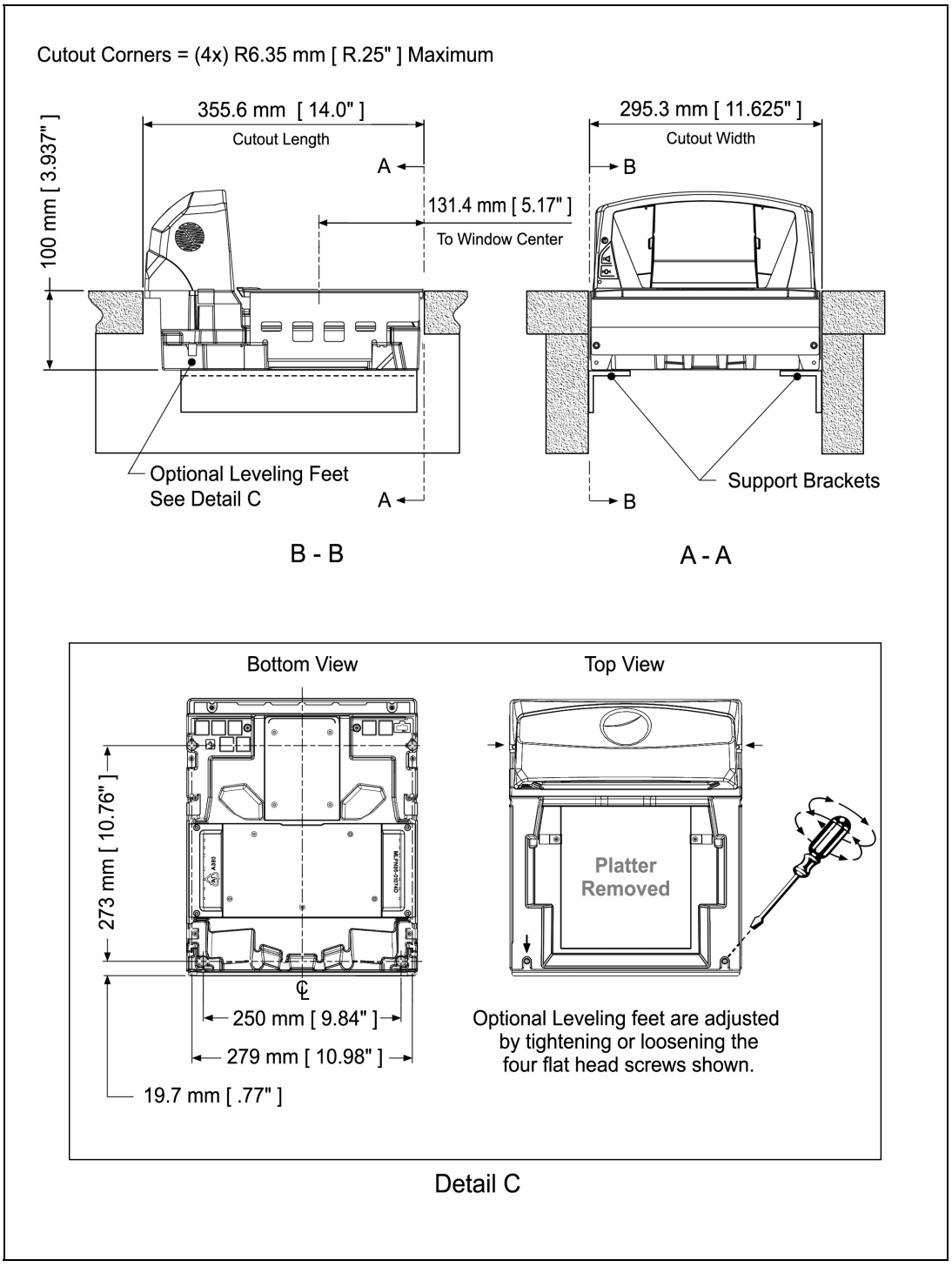


Figure 18. MS2422 Mounting Diagram

Specifications are subject to change without notice.

CABLE INSTALLATION (INTERFACE SPECIFIC)

RS232

The following steps describe how to properly install the cables for an RS232 application. The scanner **must** then be configured to match the host's RS232 parameters. Cable installation alone **does not** guarantee that the scanner will communicate properly with the host system.

> Configuration bar codes are located in the MetroSelect Configuration Guide (MLPN 00-02407x) and the MS2xxx Stratos Series Configuration Addendum (MLPN 00-02034x).

1. Turn off the host system.

2. Plug the 10-pin RJ45 end of the RS232 interface cable (MLPN 57-57210x-N-3) into the 10-pin socket labeled *Scanner Host RS232,* on the bottom of the scanner. Refer to figure on page 17.

3. Connect the other end of the RS232 cable to the proper communication port on the host device.

> STOP Before continuing, verify that the RS232 interface cable is connected to the appropriate interface socket on the scanner. An incorrect cable connection can cause communication problems or potential damage to the scanner and/or terminal.

4. Plug the external power supply (MLPN 46-002xx) into the 3-pin Molex socket labeled, DC Power In, on the bottom of the scanner.

> Check the AC input requirements of the power supply to make sure the voltage matches the AC outlet. The outlet should be located near the equipment and be easily accessible.

> Metrologic recommends using a switched AC outlet. The switch should be located on the operator's side of the checkout counter in close proximity to the scanner to facilitate calibration and service of the unit.

5. Connect AC power to the transformer. If the AC outlet is equipped with an on/off switch, turn the power on.

6. Turn on the host system.

7. Scan the recall *Recall Defaults* bar code.

> The *Recall Defaults* bar code is located in the MetroSelect Configuration Guide (MLPN 00-02407x), under *Need to Start Over*.

8. Configure the scanner to match the host system's RS232 parameters.

> Refer to the MetroSelect Configuration Guide (MLPN 00-02407x) under *Section G: RS232* for enabling RS232 Mode (scan the *recall defaults* bar code first).

CABLE INSTALLATION (INTERFACE SPECIFIC)

RS232

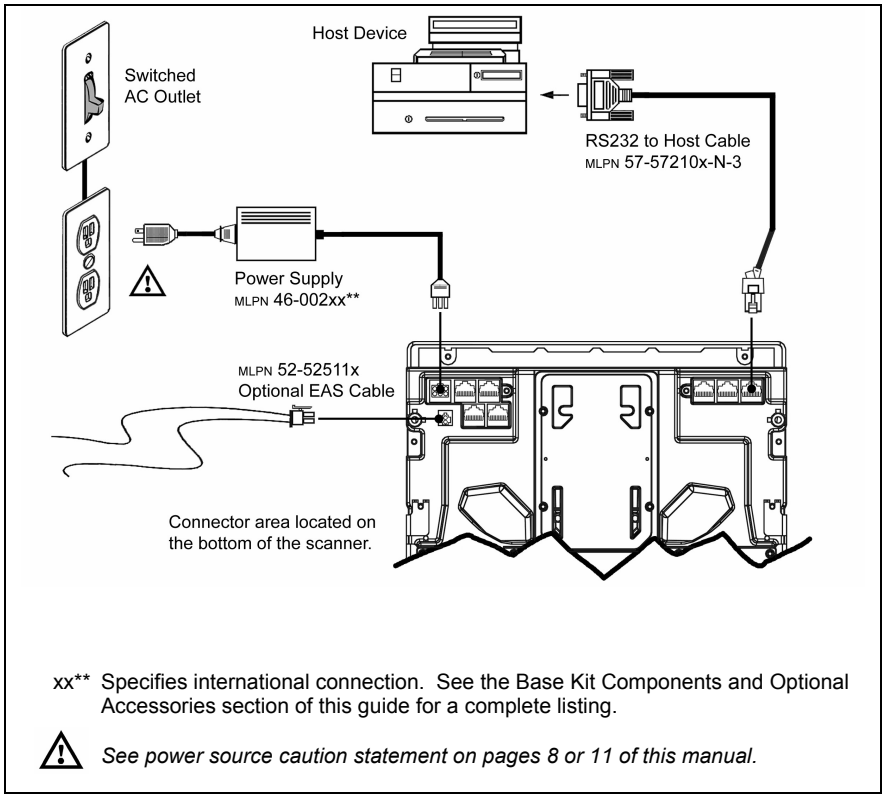

Host Device
Switched
AC Outlet
RS232 to Host Cable
MLPN 57-57210x-N-3
Power Supply
MLPN 46-002xx**
MLPN 52-52511x
Optional EAS Cable
Connector area located on
the bottom of the scanner.
xx** Specifies international connection. See the Base Kit Components and Optional Accessories section of this guide for a complete listing.
See power source caution statement on pages 8 or 11 of this manual.

Figure 19. RS232 Interface Cable Installation Schematic

CABLE INSTALLATION (INTERFACE SPECIFIC)

FULL SPEED USB

The following steps describe how to properly install the cables for a Full Speed USB scanner application. The scanner **must** then be configured to match the host's USB parameters. Cable installation alone **does not** guarantee that the scanner will communicate properly with the host system.

> Configuration bar codes are located in the MetroSelect Configuration Guide (MLPN 00-02407*x*) and the MS2*xxx* Stratos Series Configuration Addendum (MLPN 00-02034*x*).

1. Turn off the host system.

2. Plug the 10-pin RJ45 end of the USB interface cable (MLPN 57-57201*x*-N-3 or 57-57227*x*-N-3) into the 10-pin socket labeled, *Scanner Host USB*, on the bottom of the scanner. Refer to Figure on page 19.

3. Connect the other end of the USB interface cable to the appropriate USB port on the host device.

> STOP Before continuing verify that the USB interface cable is connected to the appropriate socket on the scanner. An incorrect cable connection can cause communication problems or potential damage to the scanner and/or terminal.

> *Manufacturers Note:* Plugging the scanner into the USB port of the host does not guarantee that scanned information will appear at the host. A software driver and correct configuration setting are also required for proper communication to occur.

4. Plug the external power supply (MLPN 46-002*xx*) into the 3-pin Molex socket labeled, *DC Power In*, on the bottom of the scanner.

> Check the AC input requirements of the power supply to make sure the voltage matches the AC outlet. The outlet should be located near the equipment and be easily accessible.

> Metrologic recommends using a switched AC outlet. The switch should be located on the operator's side of the checkout counter in close proximity to the scanner to facilitate calibration and service of the unit.

5. Connect AC power to the transformer. If the AC outlet is equipped with an on/off switch, turn the power on.

6. Turn on the host system.

7. Configure the scanner to match the host system's USB parameters.

> The ***IBM OEM Full Speed USB Communication Defaults******* bar code is located in the MS2*xxx Stratos Series Configuration Addendum (MLPN 00-02034x)* under Scanner Configuration Bar Codes: Dual Cable Scanner Configuration Bar Codes, IBM OEM Full Speed USB Communication Defaults and IBM OEM Full Speed USB Protocols.

**** Applies only with MS2421 non-scale scanner models. If a scale has been integrated into a scale ready MS2421, the configuration bar code shown does not apply.

CABLE INSTALLATION (INTERFACE SPECIFIC)

FULL SPEED USB

Step 8 is for USB Serial Emulation Mode or Keyboard Emulation Mode only.

8. Configure the scanner for **USB Serial Emulation Mode or USB Keyboard Emulation Mode** by scanning the appropriate configuration bar codes in the USB section of the *MetroSelect Configuration Guide (MLPN 00-02407x)* under Low Speed USB. Any low speed USB warnings may be disregarded when utilizing these codes for a Full Speed USB scanner.

> Step 7 must be completed before continuing to step 8 for these features to work properly.

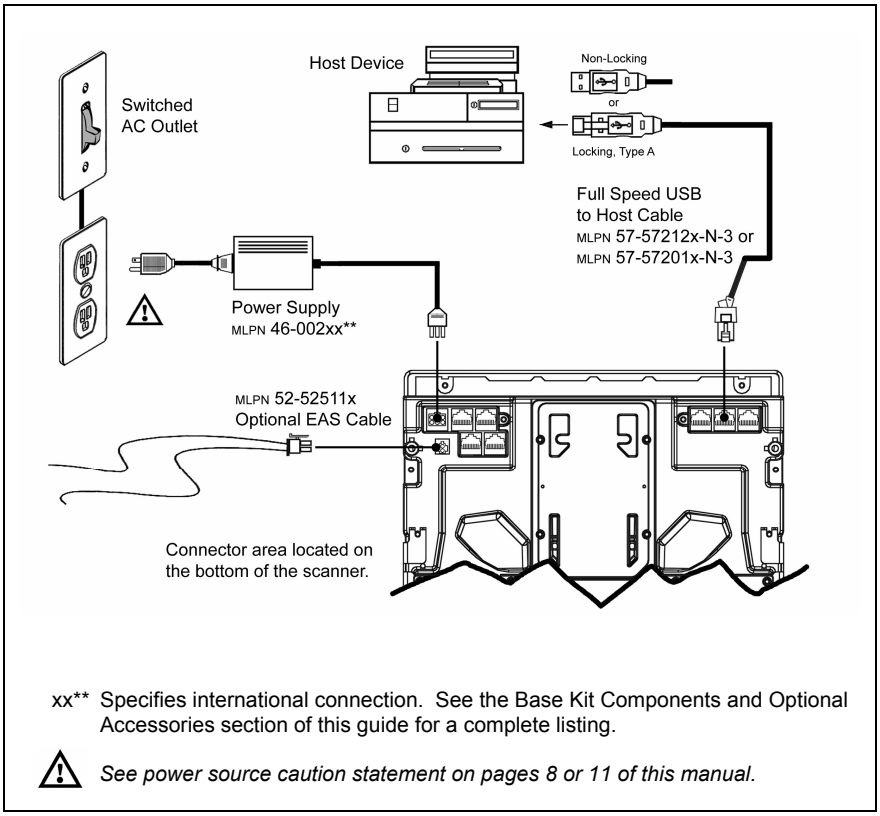

Host Device
Non-Locking
or
Locking, Type A
Switched
AC Outlet
Full Speed USB
to Host Cable
MLPN 57-57212x-N-3 or
MLPN 57-57201x-N-3
Power Supply
MLPN 46-002xx**
MLPN 52-52511x
Optional EAS Cable
Connector area located on
the bottom of the scanner.
xx** Specifies international connection. See the Base Kit Components and Optional Accessories section of this guide for a complete listing.
See power source caution statement on pages 8 or 11 of this manual.

Figure 20. USB Cable Installation Schematic

CABLE INSTALLATION (INTERFACE SPECIFIC)

IBM 46xx

The following steps describe how to properly install the cables for an IBM 46xx scanner application. The scanner **must** then be configured to match the host's IBM 46xx parameters. Cable installation alone **does not** guarantee that the scanner will communicate properly with the host system.

> Configuration bar codes are located in the MetroSelect Configuration Guide (MLPN 00-02407*x*) and the MS2*xxx* Stratos Series Configuration Addendum (MLPN 00-02034*x*).

1. Turn off the host system.

2. Plug the 10-pin RJ45 end of the IBM interface cable (MLPN 57-57212*x*-N-3) into the 10-pin socket labeled *Scanner Host 46xx*, on the bottom of the scanner. Refer to Figure on page 21.

3. Connect the other end of the IBM cable to communication port 9 on the host device.

   > STOP Before continuing verify that the IBM cable is connected to the appropriate interface socket on the scanner. An incorrect cable connection can cause communication problems or potential damage to the scanner and/or terminal.

   > *Manufacturers Note:* Plugging the scanner into the serial port of the host device does not guarantee that scanned information will appear at the host device. A software driver and correct configuration settings are also required for proper communication to occur.

4. Plug the external power supply (MLPN 46-002xx) into the 3-pin Molex socket labeled, *DC Power In*, on the bottom of the scanner.

   > Check the AC input requirements of the power supply to make sure the voltage matches the AC outlet. The outlet should be located near the equipment and be easily accessible.

   > Metrologic recommends using a switched AC outlet. The switch should be located on the operator's side of the checkout counter in close proximity to the scanner to facilitate calibration and service of the unit.

5. Connect AC power to the transformer. If the AC outlet is equipped with an on/off switch, turn the power on.

6. Turn on the host system.

7. Configure the scanner to match the host system's IBM 46xx parameters.

   > Refer to the MS2*xxx* Stratos Series Configuration Addendum (MLPN 00-02034*x*) under *Scanner Configuration Bar Codes: IBM 3rd Generation Communication Defaults* and *IBM 3rd Generation Protocols.*
   >
   > Additional general configuration bar codes can be found in the MetroSelect Configuration Guide (MLPN 00-02407*x*).

CABLE INSTALLATION (INTERFACE SPECIFIC)

IBM 46xx

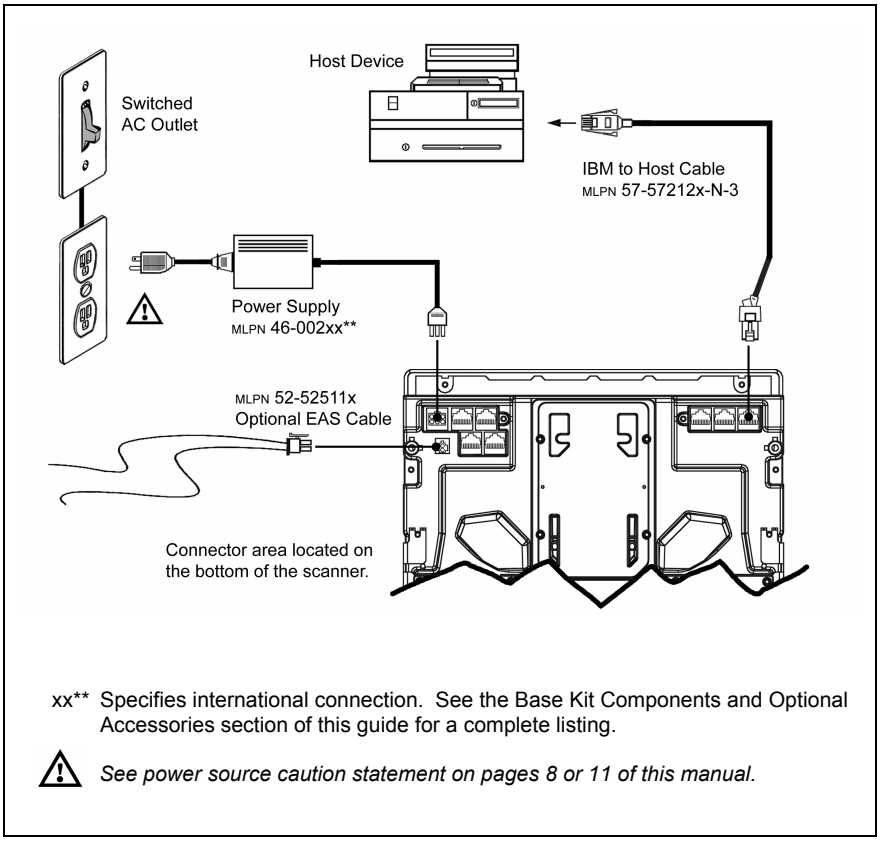

Host Device
Switched
AC Outlet
IBM to Host Cable
MLPN 57-57212x-N-3
Power Supply
MLPN 46-002xx**
MLPN 52-52511x
Optional EAS Cable
Connector area located on
the bottom of the scanner.
xx** Specifies international connection. See the Base Kit Components and Optional Accessories section of this guide for a complete listing.
See power source caution statement on pages 8 or 11 of this manual.

Figure 21. IBM Cable Installation Schematic

CABLE INSTALLATION (SECONDARY METROLOGIC SCANNER)

The following steps describe how to properly install the cables between a secondary *Metrologic* scanner and the MS2421/MS2422 scanner. The MS2421/MS2422 and the secondary scanner **must** then be configured to communicate properly. Cable installation alone **does not** guarantee that the MS2421/MS2422 scanner will communicate properly with the host system and secondary scanner.

> Contact a Metrologic customer service representative **before** connecting another manufacturer's scanner to the MS2421/MS2422 as a secondary scanner.

> Configuration bar codes are located in the MS2*xxx* Stratos Series Configuration Addendum (MLPN 00-02034*x*) under *Scanner Configuration Bar Codes: Auxiliary Port, Quick Start for a Secondary Metrologic Scanners*.

1. Refer to pages 16 - 20 for the type of interface *(RS232, IBM 46xx, etc.)* required for your application. Follow the cable installation steps under the appropriate interface before continuing. Once the communication and power cables have been installed follow step 2 below for the secondary scanner installation.

2. Connect the **straight** end of the RS232 PowerLink AUX cable (MLPN 57-57099*x*-3) into the RS232 socket of the **secondary** scanner (*see figure on page 23*).

3. Connect the **angled** end of the RS232 AUX cable (MLPN 57-57099*x*-3) into the 10-pin socket labeled ***Aux RS232 In***, on the bottom of the MS2421/MS2422 scanner.

   Important: The MS2421/MS2422 series' aux port requires the signals; transmit, receive, RTS & CTS from the secondary scanner.

> MS2421/MS2422 scanner auxiliary port will support 5VDC devices with a 150mA maximum current. If the auxiliary device exceeds this specification an external power supply will be required to power the auxiliary device.
>
> The following Metrologic scanners can receive power from the MS2421/MS2422 scanner: the MS9520, MS9540, and the MS5145.

4. **This step is required for secondary devices that require >5VDC and/or 150mA current to operate.** Skip to step 5 if the secondary device requires ≤ 5VDC.

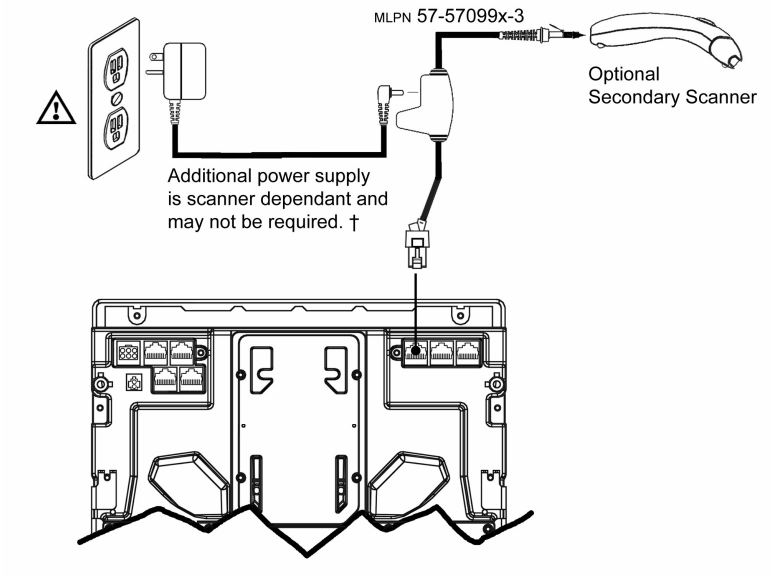
   Plug the power supply into the **secondary** scanner's PowerLink cable (MLPN 57-57099*x*-3) and connect AC power to the secondary scanner.

   > Check the AC input requirements of the power supply to make sure the voltage matches the AC outlet. The outlet should be located near the equipment and be easily accessible.

5. Configure the MS2421/MS2422 scanner and the secondary scanner. The auxiliary input port's data format must match the main output format of the secondary scanner.

   > Refer to the MS2*xxx* Stratos Series Configuration Addendum (MLPN 00-02034*x*) under *Scanner Configuration Bar Codes: Auxiliary Port, Quick Start for a Secondary Metrologic Scanners*.

CABLE INSTALLATION (SECONDARY METROLOGIC SCANNER)



† *See Aux power notes on page 22*

⚠ *See power source caution statement on pages 8 or 11 of this manual.*

Figure 22. Secondary Scanner Cable Installation Schematic

EAS DEACTIVATION

SW1 and SW2 are the switch banks inside the Checkpoint device that set the deactivation range. The following is a list of Checkpoint recommended switch bank settings.

Base Model	Checkpoint Recommended Switch Bank Settings
MS2421	SW1 & SW2 switches 1 and 6 set to ON
MS2422	SW1 & SW2 switches 1 and 6 set to ON

All MS2421/MS2422 models have a connector labeled *EAS In* on the bottom of the unit. Metrologic has an optional EAS cable (MLPN 52-52511*x*) available for purchase for connection between the Checkpoint device and the MS2421/MS2422 scanner.

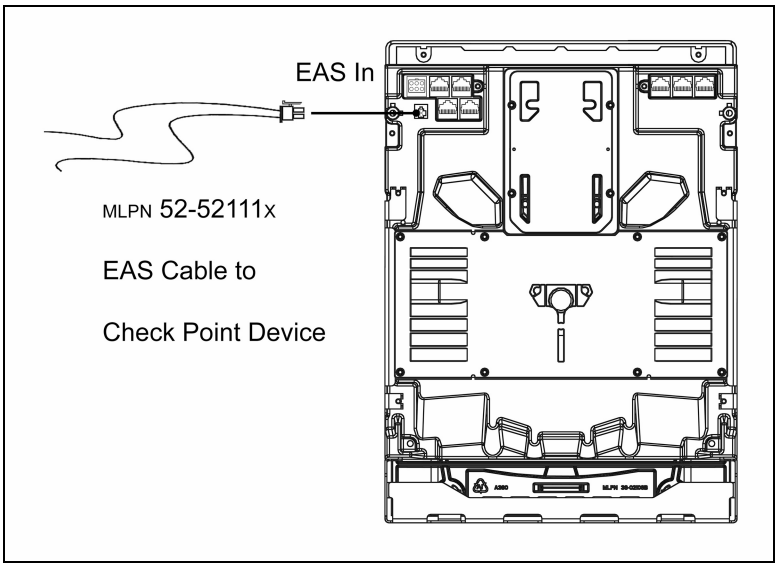


Figure 23. EAS Cable Connection (Bottom of MS2421/MS2422)

The following figure shows the location of the EAS deactivation area for the MS2421/MS2422 scanner. It is important to pass the entire tag through this area to deactivate the security tag.

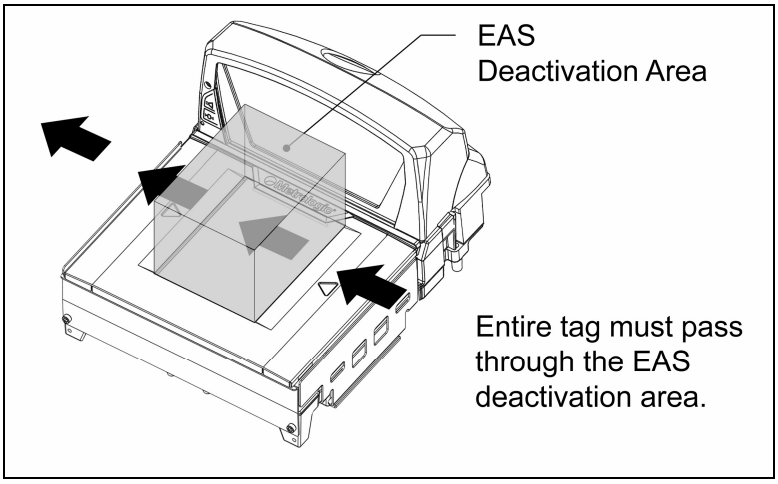


Figure 24. EAS Deactivation Area

SCAN ZONE

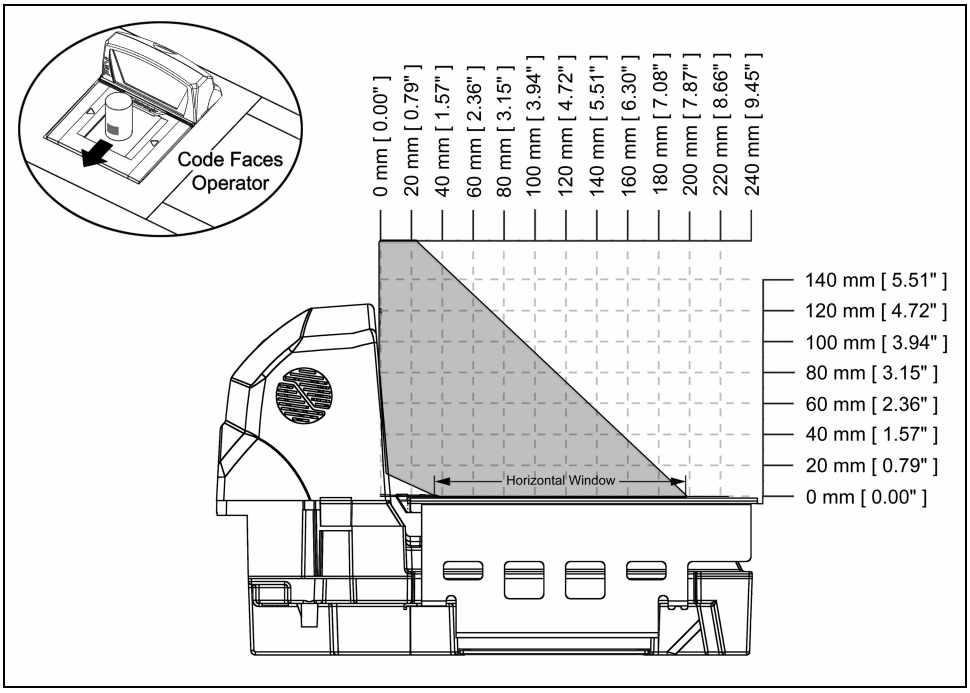


Figure 25. Checker-Side (13 mil)

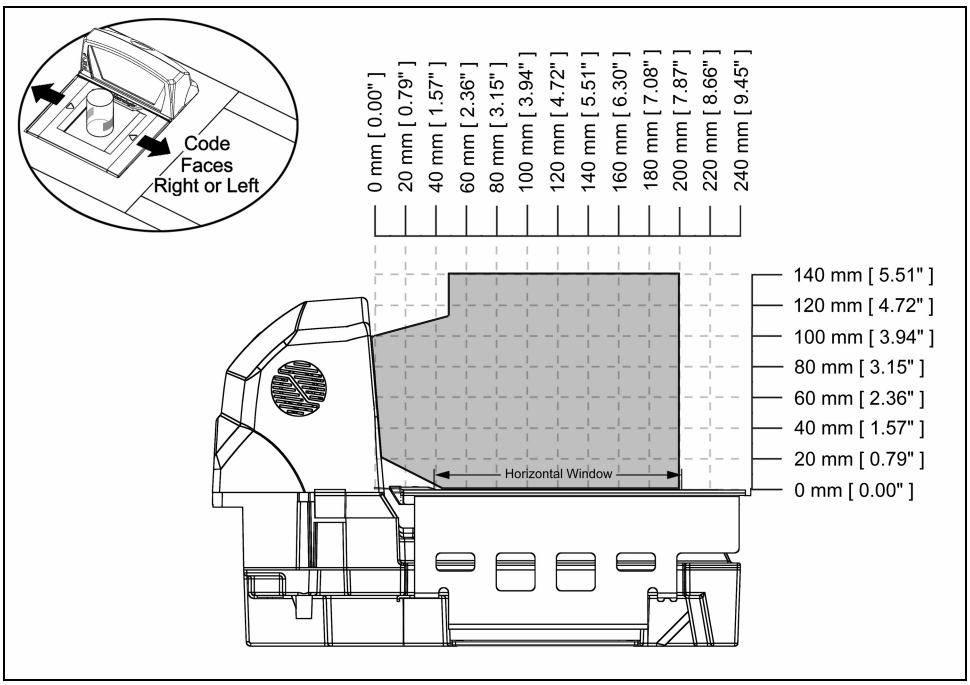


Figure 26. Horizontal Left/Right (13 mil)

Specifications are subject to change without notice.

SCAN ZONE

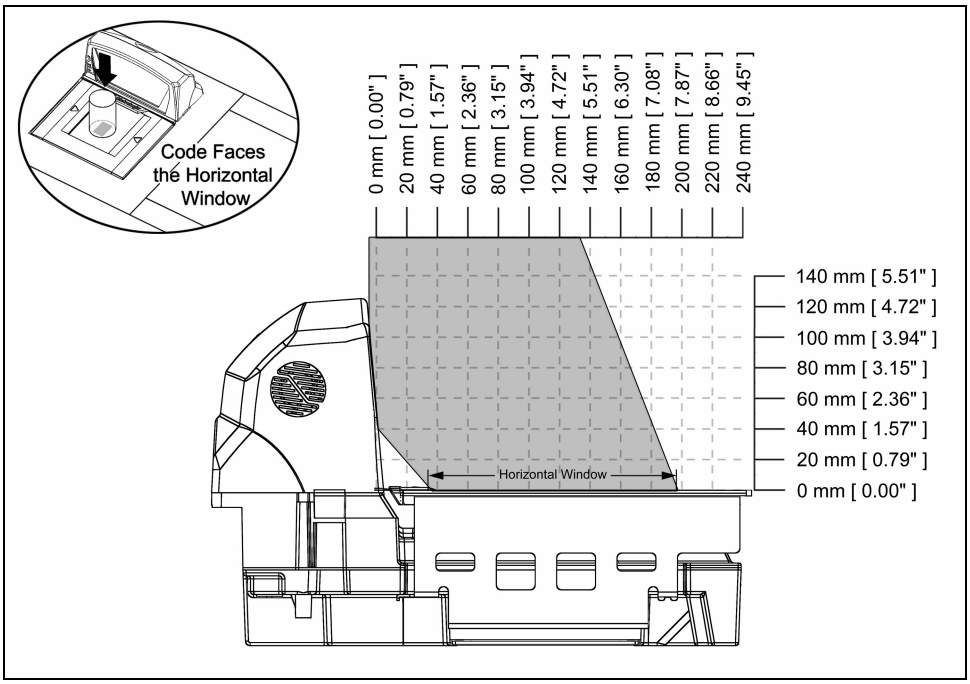


Figure 27. Horizontal Direct (13 mil)

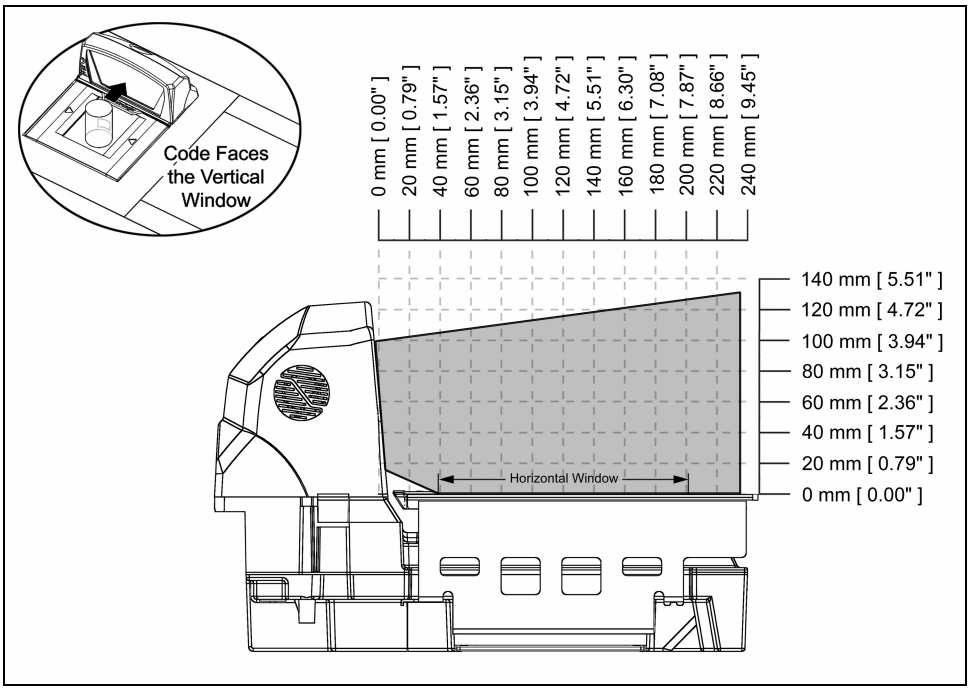


Figure 28. Vertical Direct (13 mil)

Specifications are subject to change without notice.

WAKE ACTIVATION AREA (PHOTOCELL LED OUTPUT)

The MS2421/MS2422 scanner's default power save mode† is *Dual Action Power Save Mode #2 (see page 34)*. This power save mode† turns the laser OFF after a configured period of non-use then turns the motor OFF after thirty-minute intervals. Any movement detected by the photocell in the activation area, shown below in grey, will cause the scanner to exit the power save mode. The motor will restart automatically and the laser will turn back on preparing the scanner for bar code recognition, decoding and transmission.

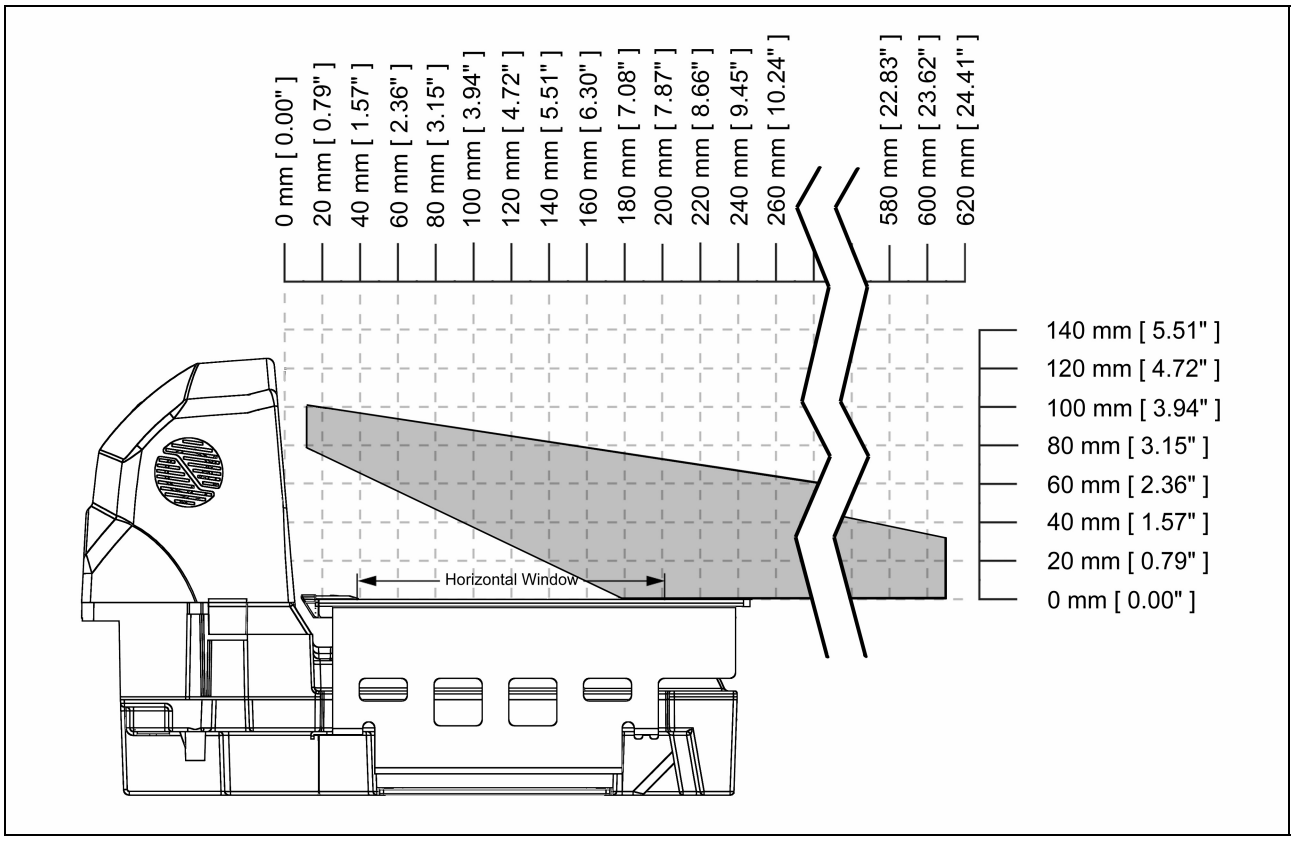


Figure 29. Wake Activation Area Perpendicular to Package Flow Default Range (Photocell LED Output)

† *Refer to the MetroSelect Configuration Guide (00-02407) for additional information on configurable power save modes.*

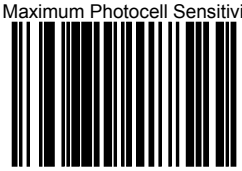
Specifications are subject to change without notice.

WAKE ACTIVATION AREA SENSITIVITY (PHOTOCELL LED OUTPUT RANGE)

Changing the Wake Area Sensitivity Level (Photocell LED Range Adjust)

The MS2400 Series bar code scanner wake area sensitivity level can be set to the end users preference by scanning one of the Photocell Sensitivity adjustment bar codes below.

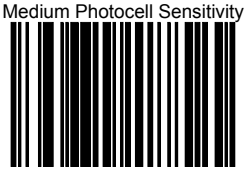
* Maximum Photocell Sensitivity



This feature enables the MS24xx to be at Max sensitivity or far sensing for the wake up photo transistor.

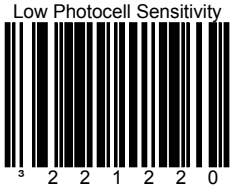
* This is the default setting.

Medium Photocell Sensitivity



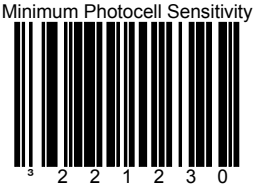
This feature enables the MS24xx to be at a medium 1 sensitivity or medium sensing for the wake up photo transistor.

Low Photocell Sensitivity



This feature enables the MS24xx to be at a low sensitivity or low sensing for the wake up photo transistor.

Minimum Photocell Sensitivity



This feature enables the MS24xx to be at the lowest sensitivity (close only) for the wake up photo transistor.

* *MS2400 Series Bar Code Scanner Default Setting*

INDICATOR DESCRIPTIONS

Audible

When in operation, the MS2421/MS2422 scanner provides audible feedback that indicates the status of the unit and the current scan. Eight settings are available for the tone of the beep (normal, 6 alternate tones and no tone) plus three volume settings. To change the tone or volume, refer to the *Changing the Beeper Tone & Volume* section of this manual.

One Beep

When the scanner *first* receives power, the blue LED will turn on and the scanner will beep once. The scanner is now ready to scan.

When the scanner *successfully* reads a bar code, the blue LED will flash and the scanner beeps once (*if configured to do so*). If the scanner does not beep once and the blue light does not flash, then the bar code has *not* been successfully read.

Razzberry Tone

This is a failure indicator. Refer to failure modes on page 30.

Three Beeps - during operation

When placing the scanner in configuration mode, the blue LED will flash while the scanner simultaneously beeps three times. The blue LED will continue to flash until the unit exits configuration mode. Upon exiting configuration mode, the scanner will beep three times and the blue LED will stop flashing.

When configured, three beeps can also indicate a communications timeout during normal scanning mode.

When using one-code-configuring, the scanner will beep three times (the current selected tone), followed by a short pause, a high tone and a low tone. This tells the user that the single configuration bar code has *successfully* configured the scanner.

Three Beeps - on power up

This is a failure indicator. Refer to failure modes on page 30.

Descending Tone

The scanner will emit a descending tone when the *microprocessor* is about to Flash upgrade.

Ascending Tone

The scanner will emit an ascending tone when the *interface coprocessor* is about to Flash upgrade.

Visual

Blue LED is located near the bottom corner of the vertical output window. When the scanner is ON, the flashing or constant, illumination of the LED indicates the status of the scanner and the current scan.

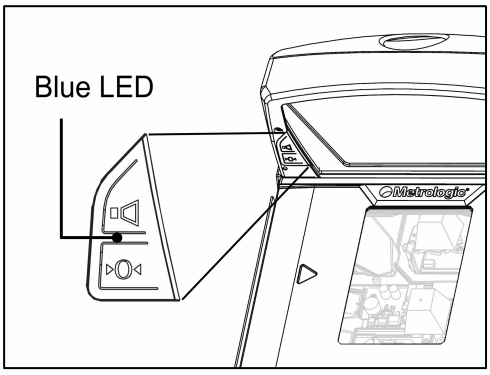


Figure 30. Blue LED

No Blue LED

The blue LED will not be illuminated if the scanner is not receiving power from the host or transformer. They are also not illuminated when all lasers are turned off.

INDICATOR DESCRIPTIONS

Visual

Steady Blue

When all lasers are active, the blue LED is illuminated. The blue LED will remain illuminated until all lasers are deactivated.

Steady Blue and Single blue Flash

When the scanner successfully reads a bar code, the blue LED will flash and the scanner will beep once. If the blue LED does not flash or the scanner does not beep once, then the bar code has not been successfully read.

Blue LED Off

After a successful scan, the scanner transmits the data to the host device. Some communication modes require that the host inform the scanner when data is ready to be received. If the host is not ready to accept the information, the scanner's blue LED will remain off until the data can be transmitted.

or

This indicates the scanner may be waiting for communication from the host.

Flashing Blue

This indicates the scanner is in program mode. A razzberry tone indicates that an invalid bar code has been scanned in this mode.

or

If the unit is in sleep mode, the blue LED will flash once every 15 seconds.

or

This indicates there is an error active on the diagnostic indicator display (see Error Codes on page 31). The scanner may continue to operate depending on the type of error.

Failure Modes

Flashing Blue and One Razzberry Tone

This indicates that the scanner has experienced a laser subsystem failure. The scanner will try up to 3 times to correct the failure condition. If the laser subsystem continues to fail, that subsystem (horizontal or vertical) will be shut down and an error indication will be shown on the Diagnostic Indicator Display. This error stays on the display until corrected. If the remaining subsystem is still operational, scanning will continue using the operational components.

Flashing Blue and Two Razzberry Tones

This indicates that the scanner has experienced a motor subsystem failure. The scanner will try up to 3 times to correct the failure condition. If the motor subsystem continues to fail, that subsystem (horizontal or vertical) will be shut down and an error indication will be shown on the Diagnostic Indicator Display. This error stays on the display until corrected. If the remaining subsystem is still operational, scanning will continue using the still operational components.

Continuous Razzberry Tone with Blue LED Off

If, upon power up, the scanner emits a continuous razzberry tone, then the scanner has an electronic failure. Return the unit for repair at an authorized service center.

Three Beeps - On Power Up

If the scanner beeps 3 times on power up then, the nonvolatile memory that holds the scanner configuration has failed. Return the unit for repair at an authorized service center.

INDICATOR DESCRIPTIONS

Diagnostic Indicator Display

There is a two-digit error code display located under horizontal output window near the Metrologic logo on the platter (see figure below).

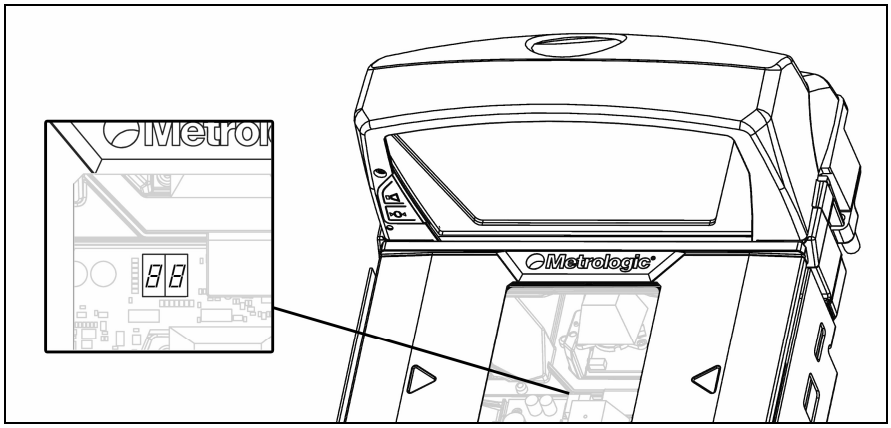


Figure 31. Error Code Display (Optional Product Roll Bar Shown)

The following is a list of possible error codes and their meanings. Some errors will require immediate scanner maintenance.

ERROR CODE	DESCRIPTION
01	Reserved
02	RAM ERROR – The scanner's Random Access Memory (RAM) is tested as faulty. Return the unit for repair at an authorized service center.
03	PROGRAM ERROR – The scanner's software program is failing. Return the unit for repair.
04	INTERFACE ERROR – After power up and any application exit (e.g. MetroSet, etc.), the scanner checks the interface hardware with that chosen in configuration. If they do not agree, an interface error exists. Correct this problem by getting the proper hardware interface OR programming MS2421/MS2422 configuration for the proper interface hardware attached.
05	CONFIGURATION ERROR – The non-volatile configuration memory did not agree with the data last saved. Default configuration data is then used and the scanner continues operating. This error is also accompanied by 3 beeps. This error will remain during operation as a reminder that this power cycle is scanning against a default-generated configuration.
06	COMMUNICATION ERROR – The RS232 data line is being held active. This causes the scanner to read a "break" signal constantly and continuous attempts are made to enter MetroSet configuration mode. A short on the RX Data line can cause this condition. It can also be the result of a laptop in power save mode. The scanner will abort attempts to enter configuration mode after a short timeout. The scanner can automatically recover from this condition once the short in the RX Data line is corrected.
09	COPROCESSOR COMMUNICATION ERROR – The main microprocessor is not communicating with the interface coprocessor. The interface coprocessor may be in a fault condition with the host or just not able to respond. This error may appear when the scanner is configured for USB or IBM interface applications or during an attempt to update the interface software through the flash utility. The unit should be repaired at an authorized service center.

INDICATOR DESCRIPTIONS

Diagnostic Indicator Display

ERROR CODE	DESCRIPTION
11	SWITCH ERROR – The switch used for volume selection or sleep mode is detected in error (always closed). The condition is self-correcting if possible. If the error persists, return the unit for repair at an authorized service center. The scanning operation can continue with this error active.
21	LASER #1 (VERTICAL) ERROR – The laser in the vertical scanning subsystem denotes a failure. The scanner will try three times to correct the laser operation. If the laser error persists, the vertical scanning subsystem will be shut down and this error code will remain on the Diagnostic Indicators.
22	LASER #2 (RIGHT HORIZONTAL) ERROR – The right laser in the horizontal scanning subsystem denotes a failure. The scanner will try three times to correct the laser operation. If the laser error persists, and the left horizontal laser (#3) is also in error, the horizontal scanning subsystem will be shut down and this error code will remain on the Diagnostic Indicators.
23	LASER #3 (LEFT HORIZONTAL) ERROR – The left laser in the horizontal scanning subsystem denotes a failure. The scanner will try three times to correct the laser operation. If the laser error persists, and the right horizontal laser (#2) is also in error, the horizontal scanning subsystem will be shut down and this error code will remain on the Diagnostic Indicators.
24	LASER #1 (VERTICAL) HIGH CURRENT WARNING – The laser in the vertical scanning subsystem is drawing excessive current. This could be a warning for a future total failure. Have the unit checked at an authorized service center when convenient.
25	LASER #2 (RIGHT HORIZONTAL) HIGH CURRENT WARNING – The laser in the vertical scanning subsystem is drawing excessive current. This could be a warning for a future total failure. Have the unit checked at an authorized service center when convenient.
26	LASER #3 (LEFT HORIZONTAL) HIGH CURRENT WARNING – The laser in the vertical scanning subsystem is drawing excessive current. This could be a warning for a future total failure. Have the unit checked at an authorized service center when convenient.
27	LASER #1 (VERTICAL) UNDERCURRENT WARNING – The laser in the vertical scanning subsystem is drawing too little current. The laser is probably not on. This could be the result of a loss of the required set point in memory. Have the unit checked at an authorized service center.
28	LASER #2 (RIGHT HORIZONTAL) UNDERCURRENT WARNING – The laser in the right horizontal scanning subsystem is drawing too little current. The laser is probably not on. This could be the result of a loss of the required set point in memory. Have the unit checked at an authorized service center.

INDICATOR DESCRIPTIONS

Diagnostic Indicator Display

ERROR CODE	DESCRIPTION
29	LASER #3 (LEFT HORIZONTAL) UNDERCURRENT WARNING – The laser in the left vertical scanning subsystem is drawing too little current. The laser is probably not on. This could be the result of a loss of the required set point in memory. Have the unit checked at an authorized service center.
31	MOTOR #1 (VERTICAL) ERROR – The motor in the vertical scanning subsystem denotes a failure. The scanner will try three times to correct the motor operation. If the motor error persists, the vertical scanning subsystem will be shut down and this error code will remain on the Diagnostic Indicators.
32	MOTOR #2 (HORIZONTAL) ERROR – The motor in the horizontal scanning subsystem denotes a failure. The scanner will try three times to correct the motor operation. If the motor error persists, the horizontal scanning subsystem will be shut down and this error code will remain on the Diagnostic Indicators.
34	MOTOR #1 (VERTICAL) SPEED ERROR – The motor in the vertical section cannot be speed controlled as desired. Have the unit checked at an authorized service center.
35	MOTOR #2 (HORIZONTAL) SPEED ERROR – The motor in the horizontal section cannot be speed controlled as desired. Have the unit checked at an authorized service center.

POWER SAVE MODES

The MS2421/MS2422 bar code scanners have five configurable power save modes. Refer to the *MetroSelect Configuration Guide* for additional information on Power Save Modes.

1. **Blink Power Save Mode:**

   Blinks the laser OFF & ON after a configured period of non-use.

   When the scanner recognizes a bar code it will exit the Blink mode.

2. **Laser Off Power Save Mode:**

   Turns the laser OFF after a configured period of non-use. The motor continues to spin allowing for a faster "wake" up time.

   Any movement detected by the photocell will "wake" the scanner from the *Laser Off* power save mode (see *Figure 29* on page 27).

3. **Laser & Motor Off Power Save Mode:**

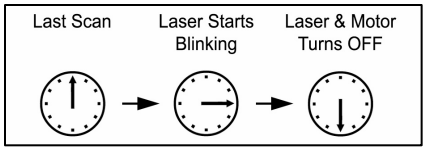
   Turns the laser and motor OFF after a configured period of non-use.

   Any movement detected by the photocell will "wake" the scanner from the power save mode (see *Figure 29* on page 27). This mode's "wake" time is slightly longer due to the motor's need to restart.

4. **Dual Action Power Save Mode #1:**

   "Blinks" the laser OFF & ON after a configured period of non-use turns the laser and motor OFF at thirty-minute intervals.

   Example:
   If the power save timeout is set to 15 minutes.

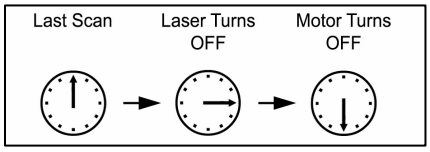


   Any movement detected by the photocell will "wake" the scanner from the power save mode (see *Figure 29* on page 27).

5. **Dual Action Power Save Mode #2 (Default):**

   Turns the laser OFF after a configured period of non-use then turns the motor OFF after thirty-minute intervals.

   Example:
   If the power save timeout is set to 15 minutes.



   Any movement detected by the photocell will "wake" the scanner from the power save mode (see *Figure 29* on page 27).

BEEPER OPTIONS AND BUTTON FUNCTIONS

Changing the Beeper Tone

Beeper tones may be configured incrementally using the following bar code. The new tone will be heard followed by a short pause. Two more new tones will be heard signifying the new setting has been stored in memory. The silent (no beep) tone is also selectable.

Next Beep Tone

³ 9 9 9 9 7 5

Changing the Beeper Volume

Volume levels may be configured using the volume button or incrementally using the following bar code. The new volume will be heard followed by a short pause. Two more tones will be heard signifying the new setting has been saved in memory. The silent (no volume) tone is also selectable.

Next Volume

³ 9 9 9 9 7 4

The Multi-Function Button

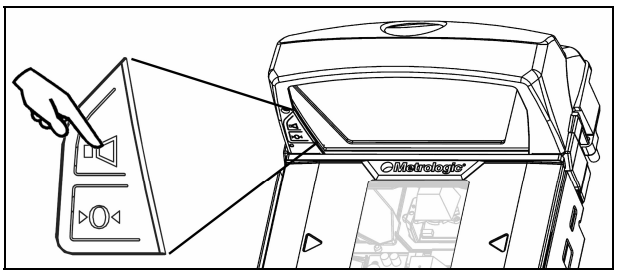


Figure 32. The Multi-Function Button

Figure 33. Changing the Beeper Volume

Changing the Beeper Volume

A short (<3 second) depression and the beeper volume will change.
The new volume will be heard. The silent (no beep) volume is also selectable.

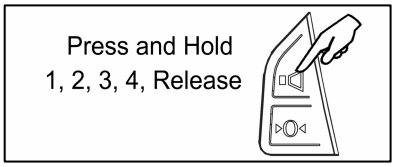


Figure 34. Laser & Motor Off Power Save Mode

Placing the Unit in Laser & Motor Off Power Save Mode

Long (>3 seconds) depression The *Laser & Motor Off Power Save Mode* is the only power save mode that can be activated with the multi-function button*.

* *This feature is configuration dependent. Refer to the MetroSelect Configuration Guide (MLPN 00-02407x) under Scanner Operation: Power Save Modes to enable this feature.*

Figure 35. Normal Operation

Waking the Unit from All Power Save Modes

The next button depression will awaken the scanner for normal operation.

SCANNER OPERATION

STARTUP

When the scanner *first* receives power, the blue LED will turn on and the scanner will beep once. The scanner is now ready to scan.

POWER-UP TEST MODE

When a MS2421/MS2422 scanner is first powered up, it cycles through a number of self-tests before starting normal operation. If there are any initial failures during this sequence of tests the scanner will beep or razz to indicate the error and an error code will appear in the diagnostic indicator display.

The following are examples of the types of tests performed at power-up.

1. Memory tests
2. Hardware setup tests
3. Motor tests
4. Laser tests
5. Configuration tests
6. Interface tests

These tests are also performed on a periodic basis with the operator alerted to any failures.

CONFIGURATION MODE

All MS2421/MS2422 bar code scanners have been configured at the factory with a set of default communication protocols. Since many host systems have unique formats and protocol requirements, Metrologic provides a wide range of configurable features that may be selected with the use of the MetroSelect® Configuration Guide (MLPN 00-02407x), the MS2xxx Stratos Series Configuration Addendum (MLPN 00-02034x) and MetroSet.

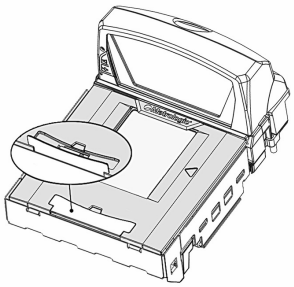
For a complete list of the factory default settings, refer to the *Default Settings* section of this guide.

HORIZONTAL SCAN WINDOW REPLACEMENT

After the replacement platter has been installed, remove all protective film from the new platter's window.
The unit will not function properly if the protective film is not removed.

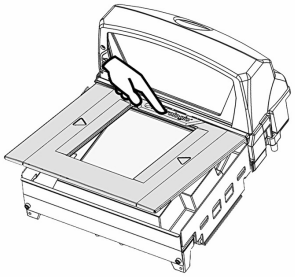
Platter/Horizontal Scan Window Removal

Flip up the handle† near the end of the platter. Grip it firmly and lift the platter off unit base.



Scale Ready - MS2421† Model

Press on the platter near the center of the Metrologic logo, and then grip the other end to remove the platter from the unit base.

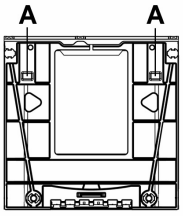


MS2422 Model

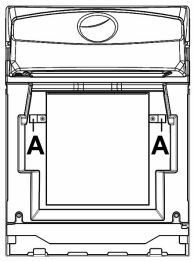
Platter/Horizontal Scan Window Installation

When installing the platter, it is important to ensure the platter is positioned properly. Carefully align the platter points shown below with the matching points indicated on the unit base. No hardware is required for platter installation.

Underside of Platter

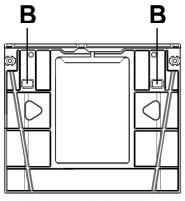


MS2421 Platter *

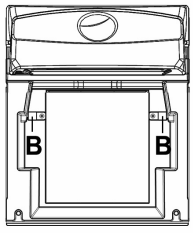


MS2421 Base Unit

Underside of Platter



MS2422 Platter *



MS2422 Base Unit

Figure 36. Platter/Horizontal Scan Window Replacement

* *See replacement parts on page 3.*

† *If the platter on the MS2421 is not equipped with a product weight roll bar / lift handle, it can be removed using the same method as shown for the MS2422.*

DAILY MAINTENANCE

Smudges and dirt can interfere with the proper scanning of a bar code. Therefore, the horizontal and vertical output windows will need occasional cleaning.

For the vertical and horizontal (platter) glass windows:

1. Spray glass cleaner onto lint free, non-abrasive cleaning cloth.
2. Gently wipe the scanner windows until clean.

TROUBLESHOOTING

The following guide is for reference purposes only. Contact a Metrologic representative at 1-800-ID-METRO or 1-800-436-3876 to preserve the limited warranty terms.

Symptom	Possible Cause(s)	Solution
All Interfaces		
No LED, beep or motor spin.	No power is being supplied to the scanner.	Check the transformer, outlet and the power strip. Make sure the power cable is plugged into the scanner.
During power up the unit beeps 3 times.	A Non-volatile RAM failure.	Contact a Metrologic service representative, if the unit will not hold the configuration.
During power up the unit razzes continuously.	A RAM or ROM failure.	Contact a Metrologic service representative, if the unit will not function.
During power up the unit razzes once and the blue LED flashes.	A VLD failure.	Contact a Metrologic service representative.
During power up the unit razzes twice and blue LED flash.	Scanner motor failure.	Contact a Metrologic service representative.
There are multiple scans upon presentation of code.	The *same symbol timeout* is set to short.	Adjust same symbol timeout for a longer time.
The unit powers up but does not beep.	The beeper is disabled.	Enable the beeper.
	No volume is selected.	Select a volume.
	No tone is selected.	Select a tone.
The unit powers up but does not scan and/or beep.	The unit is trying to scan a particular symbology that is not enabled.	UPC/EAN and Code 128 are enabled by default. Verify that the type of bar code being read has been selected.
	The unit has been configured for a character length lock or a minimum length and the bar code being scanned does not satisfy the configured criteria.	Verify that the bar code that is being scanned falls into the criteria. *Typical of Non-UPC/EAN codes. The scanner defaults to a minimum of 4 character bar code.*
The unit scans a bar code, but locks up after the first scan (*the blue LED stays on*).	The scanner is configured to support some form of host handshaking but is not receiving the signal.	If the scanner is setup to support ACK/NAK, RTS/CTS, XON/XOFF or D/E, verify that the host cable and host are supporting the handshaking properly.
The unit scans but the data transmitted to the host is incorrect.	The scanner's data format does not match the host system requirements.	Verify that the scanner's data format matches that required by the host. Make sure that the scanner is connected to the proper host port.

Symptom	Possible Cause(s)	Solution
All Interfaces		
Scanner beeps at some bar codes and NOT form others of the same bar code symbology.	The print quality of the bar code is suspect.	The type of printer and/or the printer settings could be the problem. Check the print mode or change the printer settings. For example change to econo mode or high speed.
	Check the character length lock.	
	The aspect ratio of the bar code is out of tolerance.	
The unit powers up but does not scan and/or beep.	The unit is trying to scan a particular symbology that is not enabled.	UPC/EAN and Code 128 are enabled by default. Verify that the type of bar code being read has been selected.
	The unit has been configured for a character length lock or a minimum length and the bar code being scanned does not satisfy the configured criteria.	Verify that the bar code that is being scanned falls into the criteria. *Typical of Non-UPC/EAN codes. The scanner defaults to a minimum of 4 character bar code.*
The unit beeps at some bar codes but NOT for others of the same bar code symbology.	The bar code may have been printed incorrectly.	Check if it is a check digit, character or border problem.
	The scanner is not configured correctly for this type of bar code.	Check if check digits are set properly.
	The minimum symbol length setting does not work with the bar code.	Check if the correct minimum symbol length is set.
RS232 Only		
The unit powers up OK and scans OK but does not communicate properly to the host.	The com port at the host is not working or is not configured properly.	Check to make sure that the baud rate and parity of the scanner and the communication port match and the program is looking for RS232 data.
	The cable is not connected to the proper com port.	
	The com port is not operating properly.	

TROUBLESHOOTING

Symptom	Possible Cause(s)	Solution
RS232 Only		
The host is receiving data but the data does not look correct.	The scanner and host may not be configured for the same interface.	Check that the scanner and the host are configured for the same interface.
Characters are being dropped.	The intercharacter delay needs to be added to the transmitted output.	Add some intercharacter delay to the transmitted output by using the MetroSelect Configuration Guide (MLPN 00-02407x).
Aux Port Operation With Any Interface		
The secondary scanner is not functioning.		Refer to the user's guide provided with the secondary scanner.
The secondary scanner powers up but data is not relayed to the host.	The secondary scanner cable may not be connected to the proper port on the scanner.	Ensure that the secondary scanner is connected to the MS242x com port marked "Aux" port.
	The auxiliary com port may not be operating properly.	* The scanner must be configured to enable the auxiliary port.
		The auxiliary input port's data format must match the main output format of the secondary scanner.
* Refer to the MS2xxx Stratos Series Configuration Addendum (MLPN 00-02034x) under Scanner Configuration Bar Codes: Auxiliary Port, Quick Start for a Secondary Metrologic Scanner.		

RS232 DEMONSTRATION PROGRAM

If an RS232 scanner is not communicating with your IBM compatible PC, key in the following BASIC program to test that the communication port and scanner are working. This program is for demonstration purposes only. It is only intended to prove that cabling is correct, the com port is working, and the scanner is working. If the bar code data displays on the screen while using this program, it only demonstrates that the hardware interface and scanner are working. At this point, investigate whether the application software and the scanner configuration match. If the application does not support RS232 scanners, a software wedge program that will take RS232 data and place it into a keyboard buffer may be needed. This program tells the PC to ignore RTS-CTS, Data Set Ready (DSR) and Data Carrier Detect (DCD) signals. If the demonstration program works and yours still does not, jumper RTS to CTS and Data Terminal Reading (DTR) to DCD and DSR on the back of your PC.

```
10      CLS
20      ON ERROR GOTO 100
30      OPEN "COM1:9600,S,7,1,CS0,DS0,CD0,LF" AS #1
35      PRINT "SCAN A FEW BAR CODES"
40      LINE INPUT #1, BARCODE$
50      PRINT BARCODE$
60      K$ = INKEY$: IF K$ = CHR$(27) THEN GOTO 32766
70      GOTO 40
100     PRINT "ERROR NO."; ERR; " PRESS ANY KEY TO TERMINATE."
110     K$ = INKEY$: IF K$ = "" THEN GOTO 110
32766   CLOSE: SYSTEM
32767   END
```

DEFAULT SETTINGS

COMMUNICATION PARAMETERS

Many functions of the scanner can be "configured" - that is, enabled or disabled. The scanner is shipped from the factory pre-configured to a set of default conditions. The default parameter of the scanner has an asterisk (*) in the charts on the following pages. If an asterisk is not in the default column then the default setting is Off or Disabled. Every interface does not support every parameter. If the interface supports a parameter listed in the charts on the following pages, a check mark will appear.

PARAMETER	DEFAULT	RS232	IBM 46XX	USB
UPC/EAN	*	✓	✓	✓
Code 128	*	✓	✓	✓
Code 93		✓	✓	✓
Codabar		✓	✓	✓
Interleaved 2 of 5 (ITF)		✓	✓	✓
MOD 10 Check on ITF		✓	✓	✓
Code 11		✓	✓	✓
Code 39		✓	✓	✓
Full ASCII Code 39		✓	✓	✓
MOD 43 CD on Code 39		✓	✓	✓
Transmit Mode 43 CD		✓	✓	✓
Paraff		✓	✓	✓
Paraff Lead “A”		✓	✓	✓
Allow Paraff Failures		✓	✓	✓
French PC Terminal		✓		
MSI-Plessey		✓	✓	✓
Airline (15 digit) 2 of 5		✓	✓	✓
Airline (13 digit) 2 of 5		✓	✓	✓
Matrix 2 of 5		✓	✓	✓
Telepen		✓	✓	✓
UK Plessey		✓	✓	✓
STD 2 of 5		✓	✓	✓
MSI-Plessey 10/10 Check Digit		✓	✓	✓
MSI-Plessey MOD 10 Check Digit		✓	✓	✓
ITF Symbol Lengths	Variable	✓	✓	✓
ITF Minimum Symbol Length	6	✓	✓	✓
Symbol Length Lock	None	✓	✓	✓
Minimum Symbol Length	4	✓	✓	✓
Trioptic		✓	✓	✓
RSS14 Enable		✓	✓	✓
RSS14 ID “]e0”	*	✓	✓	✓
RSS14 App ID “01”	*	✓	✓	✓
RSS14 Check Digit	*	✓	✓	✓

DEFAULT SETTINGS

COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	RS232	IBM 46XX	USB
RSS Expanded Enable		✓	✓	✓
Expanded ID "]e0"	*	✓	✓	✓
RSS Limited Enable		✓	✓	✓
RSS Limited ID "]e0"	*	✓	✓	✓
RSS Limited App ID "01"	*	✓	✓	✓
RSS Limited Check Digit	*	✓	✓	✓
DTS/SIEMENS				
DTS/NIXDORF	*			
NCR F				
NCR S				
Beeper Tone	Normal	✓	✓	✓
Beep Transmit Sequence	Before Transmit	✓	✓	✓
Beeper Volume	Loudest	✓	✓	✓
Power-Up Disable Good Scan Beep		✓	✓	✓
Communication Timeout	None	✓	✓	✓
Razzberry Tone on Timeout		✓	✓	✓
Three Beeps on Timeout		✓	✓	✓
No Beeps on Timeout	*	✓	✓	✓
Fast Beep		✓	✓	✓
Beep Twice on Supplements		✓	✓	✓
No Beeps on Timeout	*	✓	✓	✓
5 Retries Before Timeout		✓	✓	✓
Timeout In …	2 secs.	✓	✓	✓
Laser Off Between Records		✓	✓	✓
Variable Laser Off Delay	5 - 635 msec	✓	✓	✓
Disable Button Control of Power Save Mode		✓	✓	✓
Disable Button Control of Beep Volume		✓	✓	✓
Bright LED Intensity	*	✓	✓	✓
Dim LED Intensity		✓	✓	✓
Flash LED on Good Scan	*	✓	✓	✓
Reverse LED Convention		✓	✓	✓
Flash LED on Good Scan	*	✓	✓	✓
Enter Power Save Mode	61 mins.	✓	✓	✓
Blink Power Save Mode		✓	✓	✓
Laser OFF Power Save Mode		✓	✓	✓
Laser & Motor OFF Power Save Mode		✓	✓	✓
Dual Action Power Save Mode #1		✓	✓	✓

DEFAULT SETTINGS

COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	RS232	IBM 46XX	USB
Dual Action Power Save Mode #2	*	✓	✓	✓
Same Symbol Rescan Timeout: 500 msecs Configurable in 50 msec steps (MAX 6.35 seconds)	*	✓	✓	✓
Intercharacter Delay Configurable in 1 msec steps (MAX 255 msecs)	1 msecs 10 msecs in KBW	✓	✓	
Number of Scan Buffers	1	✓	✓	✓
UPC GTIN-14 Format		✓	✓	✓
EAN-8 Enable	*	✓	✓	✓
Transmit EAN-8 Check Digit	*	✓	✓	✓
Convert EAN-8 to EAN-13		✓	✓	✓
EAN-8 with Small Borders		✓	✓	✓
EAN-13 Enable	*	✓	✓	✓
Transmit EAN-13 Check Digit	*	✓	✓	✓
UPC-A Enable	*	✓	✓	✓
Convert UPC-A to EAN-13		✓	✓	✓
Transmit UPC-A Check Digit	*	✓	✓	✓
Transmit UPC-A Number System	*	✓	✓	✓
Transmit UPC-A Manufacturers ID.	*	✓	✓	✓
Transmit UPC-A Item ID	*	✓	✓	✓
UPC-E Enable	*	✓	✓	✓
Expand UPC-E		✓	✓	✓
Transmit UPC-E Lead ‘0’	*	✓	✓	✓
Transmit UPC-E Check Digit		✓	✓	✓
Disable UPC-E Auto Redundancy	*	✓	✓	✓
Transmit Codabar Start/Stop Characters		✓	✓	✓
Codabar CLSI		✓	✓	✓
Dual Field Codabar		✓	✓	✓
Tab Between Dual field Codabar		✓	✓	✓
Codabar CLSI Check Digit		✓	✓	✓
Codabar 7-Check Check Digit		✓	✓	✓
Codabar Mod-16 Check Digit		✓	✓	✓
Transmit MSI Plessey Check Digits		✓	✓	✓
Number of MSI Plessey Check Digits	0	✓	✓	✓
UK Plessey A to X Convert		✓	✓	✓
UK Plessey Special 12 Character Format		✓	✓	✓
Transmit UK Plessey Check Digit		✓	✓	✓

DEFAULT SETTINGS

COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	RS232	IBM 46XX	USB
EAN 128 Enable		✓	✓	✓
Enable French Pharma		✓	✓	✓
Enable Matrix 2 of 5 Check Digit		✓	✓	✓
Enable Hong Kong 2 of 5		✓	✓	✓
Enable Alpha Telepen		✓	✓	✓
Telepen Convert Lead '^L' to 'E'		✓	✓	✓
Enable Code 11 Check Digit		✓	✓	✓
Parity	Space	✓		
Baud Rate	9600	✓		
8 Data Bits		✓		
7 Data Bits	*	✓		
Stop Bits	2	✓		
RTS / CTS Enabled		✓		
Message RTS		✓		
Character RTS	*	✓		
ACK / NAK		✓		
O / N Handshaking		✓		
Host Bell / Cancel		✓		
Xon / Xoff		✓		
No Transmit Without DTR Present		✓		
French PC Terminal Emulation		✓		
"D/E" Disable Command		✓		
"Z/R" Disable Command		✓		
"F/L" Laser Command		✓		
"M/O" Motor Enable Commands		✓		
Beep on Bell		✓		
Razz on 'z'		✓		
CTS Scan Transmit Enable		✓		
Limit 1 Scan per CTS		✓		
Activate on DTR		✓	✓	✓
Activate on DC2 Character		✓		
Xmit No Read Message on DC2 Timeout		✓		
No Transmit LED During No Read Message		✓		
Configurable "No Read" Message		✓		
Recv "I" = Transmit "METROLOGIC"		✓		
Recv "i" = Transmit Scanner ID Byte		✓		

DEFAULT SETTINGS

COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	RS232	IBM 46XX	USB
STX Prefix		✓		✓
TAB Prefix		✓		✓
Metrologic Prefix		✓		✓
UPC Prefix		✓		✓
ETX Suffix		✓		✓
TAB Suffix		✓		✓
Carriage Return Suffix	*	✓		✓
Line Feed Suffix	*	✓		✓
UPC Suffix		✓		✓
Transmit LRC		✓		✓
Start LRC on 1st Byte		✓		✓
Start LRC on 2nd Byte		✓		✓
'c' Prefix for UPC		✓		✓
'$' Prefix for UPC		✓		✓
Configurable Prefix Characters	10 avail	✓		✓
Configurable Suffix Characters	10 avail	✓		✓
Predefined Code ID Sets	Multiple Selections	✓		✓
Configurable Prefix for Code Types		✓		✓
Configurable Suffix for Code Types		✓		✓
Configurable Code Length Locks	7 avail	✓	✓	✓
Code Selects	7 avail	✓	✓	✓
Transmit High Priority Code at Timeout		✓	✓	✓
Random Code Deselects	1 Set	✓	✓	✓
Do not transmit Similar Codes		✓	✓	✓
Target Code Deselects	1 Set	✓	✓	✓
Transmit Lower Priority Codes		✓	✓	✓
Code Select / Deselect Timeout 0.1 to 25.5 seconds	5 sec	✓	✓	✓
Razz on Code Select Timeout	*	✓	✓	✓
Replace 1 Character in Transmission		✓		✓
Japan Dual Field Code Selects		✓	✓	✓
EAN-13 Only in Japan Dual Field		✓	✓	✓
Two Digit Supplements		✓	✓	✓
Five Digit Supplements		✓	✓	✓
Require Supplements		✓	✓	✓
Remote Supplement Support		✓	✓	✓
Two Digit Redundancy		✓	✓	✓

DEFAULT SETTINGS

COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	RS232	IBM 46XX	USB
Five Digit Redundancy		✓	✓	✓
Enable Coupon Code 128		✓	✓	✓
Transmit Coupon ‘]C1’	*	✓	✓	✓
Group Separator	*	✓	✓	✓
Coupon Code Can Begin with ’4’		✓	✓	✓
Enable EAN-99 Coupon Code		✓	✓	✓
Bookland Supplements		✓	✓	✓
French 378/379 Supplements		✓	✓	✓
German 434/439 Supplements		✓	✓	✓
Convert Bookland to ISBN		✓	✓	✓
Bookland 979 Supplements		✓	✓	✓
Convert 979 to ISBN		✓	✓	✓
Convert 290 to ISBN		✓	✓	✓
Reformat ISBN		✓	✓	✓
Add EAN Article ID		✓	✓	✓
Transmit ISBN / EAN Check Digit		✓	✓	✓
977 Supplements (2-digit)		✓	✓	✓
Convert 977 to ISSN		✓	✓	✓
Reformat ISSN		✓	✓	✓
Transmit ISSN Check Digit		✓	✓	✓
414 / 419 Requires Supplements		✓	✓	✓
Number System 2 Enables Supplements		✓	✓	✓
Number System 2 Requires 5-Digit Supplements		✓	✓	✓
Number System 5 Enables Supplements		✓	✓	✓
Allow Code ID’s with Supplements		✓	✓	✓
High Density Codes	*	✓	✓	✓
Medium Density Codes		✓	✓	✓
Low Density Codes		✓	✓	✓

DEFAULT SETTINGS

COMMUNICATION PARAMETERS

Default settings for "*Aux*" interface

The secondary scanner and the MS2421/MS2422 scanner always communicates via RS232. Data is relayed to the host via various primary interfaces

PARAMETER	DEFAULT	RS232	IBM 46XX	USB
Aux Baud Rate	38400	✓	✓	✓
Aux Parity	none	✓	✓	✓
Aux Data Bits	8	✓	✓	✓
Aux Stop Bits	1	✓	✓	✓
Aux Character RTS	*	✓	✓	✓
Aux Message RTS		✓	✓	✓
Aux Ack/Nak	*	✓	✓	✓
Aux Xon/Xoff	*	✓	✓	✓
Aux D/E Commands		✓	✓	✓
Aux M/O Commands		✓	✓	✓
Aux F/L Commands		✓	✓	✓
Aux Intercharacter Delay	1 msec	✓	✓	✓
Aux Port Data Format	None (Disabled)	✓	✓	✓
Aux Port to Stratos***SCHOOL***I†	None (Disabled)	✓	✓	✓

† When the *Aux Port* connects to a host port, the *Aux Port Data Format* should be disabled (requires cable MLPN 57-57008x-N-3).

SCANNER PINOUT CONNECTIONS

The MS2421/MS2422 scanner terminates to 10-pin modular jacks located on the bottom of the unit. The serial number label indicates the model number and interface of the scanner.

EAS	
Pin	**Function**
1	EAS In
2	EAS Out

DC Power	
Pin	**Function**
1	*No Connect*
2	Earth Ground
3	*No Connect*
4	5.2VDC
5	Ground
6	12VDC

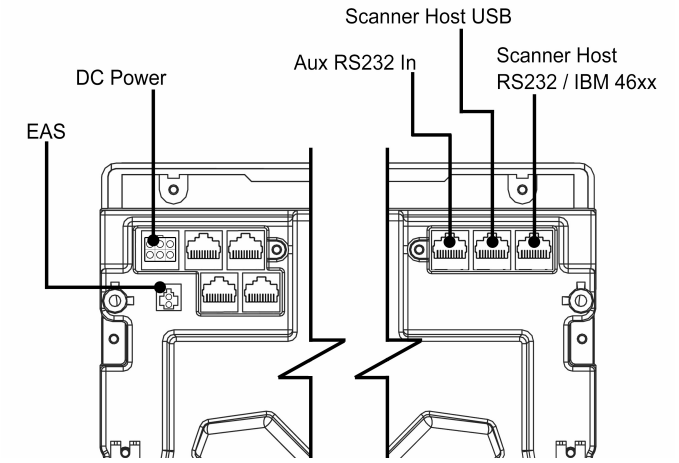


Figure 37. Connector Layout

Scanner to Host, IBM 46xx	
Pin	**Function**
1	Signal Ground
2	*Reserved for RS232 Interface*
3	*Reserved for RS232 Interface*
4	*Reserved for RS232 Interface*
5	*Reserved for RS232 Interface*
6	*Reserved for RS232 Interface and EAS*
7	*No Connect*
8	*Reserved for RS232 Interface and EAS*
9	IBM B-
10	IBM A+

Scanner to Host, RS232	
Pin	**Function**
1	Ground
2	RS232 Transmit
3	RS232 Receive
4	RS232 RTS Output
5	RS232 CTS Input
6	RS232 DTR Input (EAS GPIO IN)
7	*No Connect*
8	DSR (EAS GPIO OUT)
9	*Reserved for IBM 46xx Interface*
10	*Reserved for IBM 46xx Interface*

Scanner to Host, USB	
Pin	**Function**
1	Signal Ground
2	RS232 Transmit
3	RS232 Receive
4	Shield
5	*No Connect*
6	RS232 CTS Input (EAS GPIO IN)
7	PC+5VDC
8	RS232 RTS Output (EAS GPIO OUT)
9	Data -
10	Data +

Auxiliary RS232 In	
Pin	**Function**
1	Ground
2	RS232 Receive Input
3	RS232 Transmit Output
4	RS232 RTS In
5	RS232 CTS Out
6	*EAS GPIO IN*
7	Ground
8	EAS GPIO OUT
9	+5V Out
10	*No Connect*

Specifications are subject to change without notice.

SCALE READY MS2421 MODELS – ADDITIONAL PINOUT CONNECTIONS

There are four additional 10-pin modular jacks located on the bottom of the of the MS2421 scanner models that may be used for an integrated scale application and the use of a remote display.

Please keep in mind that every application is unique. The use of these connections depends on the specifications of the scale's manufacturer. The following pinouts are for **reference only**. If the scanner has been integrated with a scale, refer to the ***Scale Addendum*** for detailed instructions on the appropriate cable connections, communication specifications and calibration procedures required by the scale manufacturer and local Weights and Measures authorities.

When connecting any combination of scale/external scale display to the M2421 do not exceed the following current restrictions: 12V @ 0.7A max. / 5V @ 0.2A max.

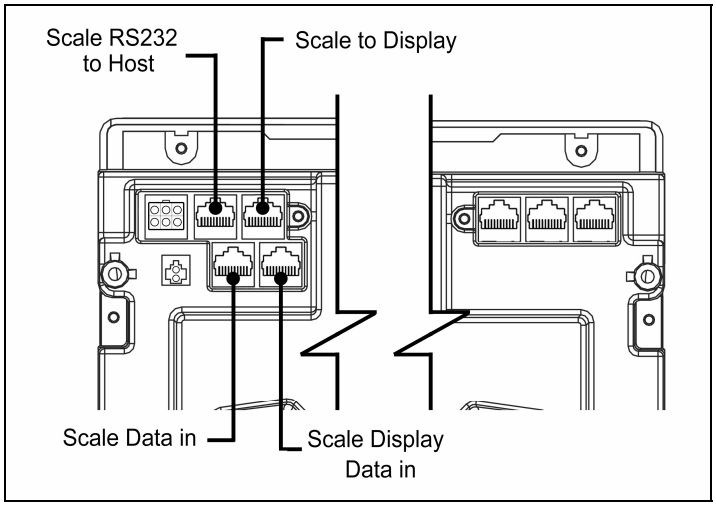


Figure 38. Scale Ready Connector Layout

Scale Display Data In Scale
Data to Display from the Load Cell Interface

Pin	Function **
1	SIG1
2	SIG2
3	SIG3
4	SIG4
5	SIG5
6	SIG6
7	SIG7 ††
8	SIG8 ††
9	SIG9 ††
10	SIG10 ††

Scale Data In
RS232 from the Load Cell Interface

Pin	Function**
1	12V
2	Ground
3	5V
4	Ground
5	RS232 TX In
6	RS232 RX Out
7	RS232 CTS In
8	RS232 RTS Out
9	Scale Status, TTL
10	Scale Zero, TTL

Scale RS232 to Host
Scale Data, Dual Cable Applications

Pin	Function**
1	Ground
2	Scale RS232 TX Out
3	Scale RS232 RX In
4	Scale RS232 RTS Out
5	Scale RS232 CTS In
6	*No Connect*
7	*No Connect*
8	*No Connect*
9	*No Connect*
10	Shield

Scale to Display

Pin	Function**
1	SIG1
2	SIG2
3	SIG3
4	SIG4
5	SIG5
6	SIG6
7	SIG7 ††
8	SIG8 ††
9	SIG9 ††
10	SIG10 ††

*** All signals are referenced from the MS2421/MS2422 scanner.*

†† *The use of these pins depends upon the specifications of the scale's manufacturer.*

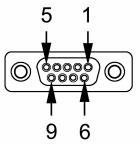
Specifications are subject to change without notice.

CABLE CONNECTOR CONFIGURATIONS

The following cables are examples of some of the standard cables that may be shipped with the MS2421/MS2422 bar code scanner. Please keep in mind that every application is unique and the cables received with the MS2421/MS2422 scanner may be custom cables that are not shown below.

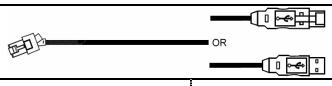
RS232 Interface Cable, MLPN 57-57210*x*-N-3

Pin	Function**
1	*No Connect*
2	RS232 TX Output
3	RS232 RX Input
4	DTR Input
5	Power/Signal Ground
6	DSR Output
7	CTS Input
8	RTS Output
9	*No Connect*



9-Pin D-Type Connector

Full Speed USB Cable,
MLPN 57-57201*x*-N-3 or MLPN 57-57227*x*-N-3



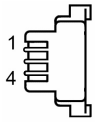
Pin	Function**
1	PC+5V USB
2	Data -
3	Data +
4	Ground

Locking,
Type A
57-57227x-N-3

Non-Locking, Type A
57-57201x-N-3

IBM 46xx Cable, MLPN 57-57212*x*-N-3

Pin	Function**
1	Signal Ground
2	IBM A+
3	IBM B -
4	*No Connect*



4-Pin SDL

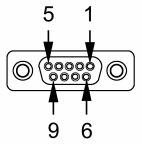
** *All signals are referenced from the MS2421/MS2422 scanner.*

Specifications are subject to change without notice.

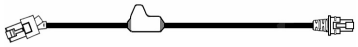
CABLE CONNECTOR CONFIGURATIONS

Aux Port Configuration Cable*, MLPN 57-57008*x*-N-3	

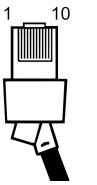
Pin	Function**
1	*No Connect*
2	Output from Scanner
3	Input to Scanner
4	*No Connect*
5	Ground
6	*No Connect*
7	*No Connect*
8	*No Connect*
9	*No Connect*



9-Pin D-Type Connector

RS232 LSO/AUX Cable, MLPN 57-57099*x*-3	

Pin	Function†
1	Signal Ground
2	RS232 from Aux / Secondary Scanner
3	RS232 to Aux / Secondary Scanner
4	RTS from Aux / Secondary Scanner
5	CTS to Aux / Secondary Scanner
6	*No Connect*
7	*No Connect*
8	*No Connect*
9	+5VDC – Transformer / Direct
10	Shield Ground



10-Position Angled Modular Plug

* *This configuration cable was designed to be used with the MS2421/MS2422 auxiliary connector only.*

** *All signals are referenced from the MS2421/MS2422 scanner.*

† *All signals are referenced from the auxiliary / secondary scanner.*

Specifications are subject to change without notice.

SAFETY

ITE Equipment
IEC 60950-1; EN 60950-1

Laser
Laser Class 1: IEC 60825-1:1993+A1+A2, EN: 60825-1:1994+A1+A2

⚠ Caution
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure. Under no circumstances should the customer attempt to service the laser scanner. Never attempt to look at the laser beam, even if the scanner appears to be nonfunctional. Never open the scanner in an attempt to look into the device. Doing so could result in hazardous laser light exposure. The use of optical instruments with the laser equipment will increase eye hazard.

⚠ Atención
La modificación de los procedimientos, o la utilización de controles o ajustes distintos de los especificados aquí, pueden provocar una luz de láser peligrosa. Bajo ninguna circunstancia el usuario deberá realizar el mantenimiento del láser del escáner. Ni intentar mirar al haz del láser incluso cuando este no esté operativo. Tampoco deberá abrir el escáner para examinar el aparato. El hacerlo puede conllevar una exposición peligrosa a la luz de láser. El uso de instrumentos ópticos con el equipo láser puede incrementar el riesgo para la vista.

⚠ Attention
L'emploi de commandes, réglages ou procédés autres que ceux décrits ici peut entraîner de graves irradiations. Le client ne doit en aucun cas essayer d'entretenir lui-même le scanner ou le laser. Ne regardez jamais directement le rayon laser, même si vous croyez que le scanner est inactif. N'ouvrez jamais le scanner pour regarder dans l'appareil. Ce faisant, vous vous exposez à une rayonnement laser qú êst hazardous. L'emploi d'appareils optiques avec cet équipement laser augmente le risque d'endommagement de la vision.

⚠ Achtung
Die Verwendung anderer als der hier beschriebenen Steuerungen, Einstellungen oder Verfahren kann eine gefährliche Laserstrahlung hervorrufen. Der Kunde sollte unter keinen Umständen versuchen, den Laser-Scanner selbst zu warten. Sehen Sie niemals in den Laserstrahl, selbst wenn Sie glauben, daß der Scanner nicht aktiv ist. Öffnen Sie niemals den Scanner, um in das Gerät hineinzusehen. Wenn Sie dies tun, können Sie sich einer gefährlichen Laserstrahlung aussetzen. Der Einsatz optischer Geräte mit dieser Laserausrüstung erhöht das Risiko einer Sehschädigung.

⚠ Attenzione
L'utilizzo di sistemi di controllo, di regolazioni o di procedimenti diversi da quelli descritti nel presente Manuale può provocare delle esposizioni a raggi laser rischiose. Il cliente non deve assolutamente tentare di riparare egli stesso lo scanner laser. Non guardate mai il raggio laser, anche se credete che lo scanner non sia attivo. Non aprite mai lo scanner per guardare dentro l'apparecchio. Facendolo potete esporVi ad una esposizione laser rischiosa. L'uso di apparecchi ottici, equipaggiati con raggi laser, aumenta il rischio di danni alla vista.

EMC

Emissions: FCC Part 15, ICES-003, CISPR 22, EN 55022
Immunity: CISPR 24, EN 55024

Class A Devices

The following is applicable when the scanner cable is greater in length than 3 meters (9.8 feet) when fully extended:

Les instructions ci-dessous s'appliquent aux cables de scanner dépassant 3 métres (9.8 pieds) de long en extension maximale:

Folgendes trifft zu, wenn das Scannerkabel länger als 3 Meter ist:

This equipment has been tested and found to comply with limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense. Any unauthorized changes or modifications to this equipment could void the user's authority to operate this device.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Notice
This Class A digital apparatus complies with Canadian ICES-003.

Remarque
Cet appareil numérique de classe A est conforme à la norme canadienne NMB-003.

European Standard

Warning
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Funkstöreigenschaften nach EN55022:1998

Warnung!
Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen. In diesem Fall kann vom Betreiber verlangt werden, angemessene Massnahmen durchzuführen.

Standard Europeo

Attenzione
Questo e' un prodotto di classe A. Se usato in vicinanza di residenze private potrebbe causare interferenze radio che potrebbero richiedere all'utilizzatore opportune misure.

Attention
Ce produit est de classe "A". Dans un environnement domestique, ce produit peut être la cause d'interférences radio. Dans ce cas l'utiliseteur peut être amené à predre les mesures adéquates.

EMC

Class B Devices

The following is applicable when the scanner cable is less than 3 meters (9.8 feet) in length when fully extended:

Les instructions ci-dessous s'appliquent aux cables de scanner ne dépassant pas 3 métres (9.8 pieds) de long en extension maximale:

Folgendes trifft zu, wenn das Scannerkabel kürzer als 3 Meter ist:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Notice
This Class B digital apparatus complies with Canadian ICES-003.

Avertissement
Cet appareil numérique de classe B est conforme à la norme canadienne NMB-003.

LIMITED WARRANTY

The MS2400 Series bar code scanners are manufactured by Metrologic at its Blackwood, New Jersey, U.S.A. facility and at its Suzhou, China facility. The MS2400 Series bar code scanners have a two (2) year limited warranty from the date of manufacture. Metrologic warrants and represents that all MS2400 Series bar code scanners are free of all defects in material, workmanship and design, and have been produced and labeled in compliance with all applicable U.S. Federal, state and local laws, regulations and ordinances pertaining to their production and labeling.

This warranty is limited to repair, replacement of product or refund of product price at the sole discretion of Metrologic. Faulty equipment must be returned to one of the following Metrologic repair facilities: Blackwood, New Jersey, USA; Madrid, Spain; or Suzhou, China. To do this, contact the appropriate Metrologic Customer Service/Repair Department to obtain a Returned Material Authorization (RMA) number.

In the event that it is determined the equipment failure is covered under this warranty, Metrologic shall, at its sole option, repair the Product or replace the Product with a functionally equivalent unit and return such repaired or replaced Product without charge for service or return freight, whether distributor, dealer/reseller, or retail consumer, or refund an amount equal to the original purchase price.

This limited warranty does not extend to any Product which, in the sole judgment of Metrologic, has been subjected to abuse, misuse, neglect, improper installation, or accident, nor any damage due to use or misuse produced from integration of the Product into any mechanical, electrical or computer system. The warranty is void if the case of Product is opened by anyone other than Metrologic's repair department or authorized repair centers.

THIS LIMITED WARRANTY, EXCEPT AS TO TITLE, IS IN LIEU OF ALL OTHER WARRANTIES OR GUARANTEES, EITHER EXPRESS OR IMPLIED, AND SPECIFICALLY EXCLUDES, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE UNDER THE UNIFORM COMMERCIAL CODE, OR ARISING OUT OF CUSTOM OR CONDUCT. THE RIGHTS AND REMEDIES PROVIDED HEREIN ARE EXCLUSIVE AND IN LIEU OF ANY OTHER RIGHTS OR REMEDIES. IN NO EVENT SHALL METROLOGIC BE LIABLE FOR ANY INDIRECT OR CONSEQUENTIAL DAMAGES, INCIDENTAL DAMAGES, DAMAGES TO PERSON OR PROPERTY, OR EFFECT ON BUSINESS OR PROPERTY, OR OTHER DAMAGES OR EXPENSES DUE DIRECTLY OR INDIRECTLY TO THE PRODUCT, EXCEPT AS STATED IN THIS WARRANTY. IN NO EVENT SHALL ANY LIABILITY OF METROLOGIC EXCEED THE ACTUAL AMOUNT PAID TO METROLOGIC FOR THE PRODUCT. METROLOGIC RESERVES THE RIGHT TO MAKE ANY CHANGES TO THE PRODUCT DESCRIBED HEREIN.

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PATENTS

Patent Information

This METROLOGIC product may be covered by, but not limited to, one or more of the following U.S. Patents:

U.S. Patent No.;

5,343,027; 5,627,359; 5,686,717; 5,789,731; 5,828,049; 6,029,894; 6,209,789; 6,299,065; 6,345,505; 6,422,467; 6,481,625; 6,494,377; 6,814,292; 6,830,190; 6,874,690; 6,918,540; 6,951,304;

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Other worldwide patents pending.

A

AC ..... *see power*
application 31, 41
audible ..... *see indicators*
AUX 6, 41, 49

B

beep ..... *see indicators*
blue LED ..... *see indicators*
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  tone 6, 9, 35
  volume 6, 9, 35

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